ENGINEERING NEWS-RECORD

SEPT. 15, 1960

PRICE 50 CENTS

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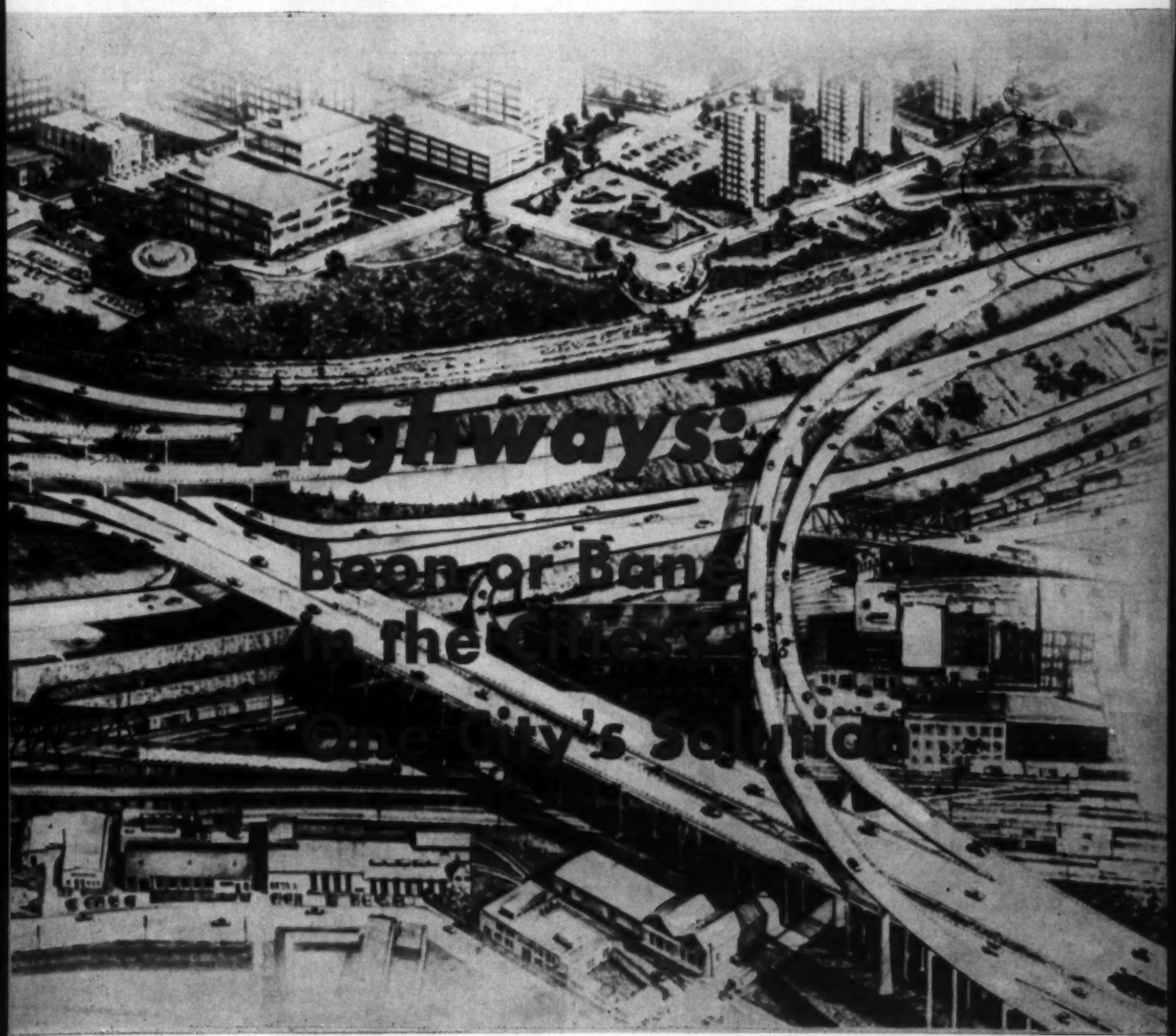

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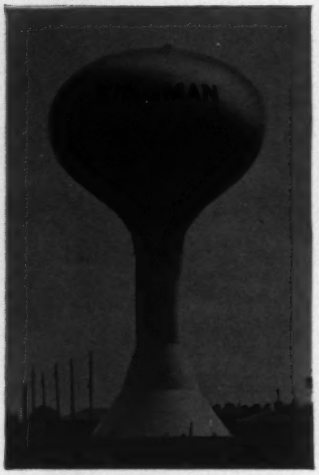
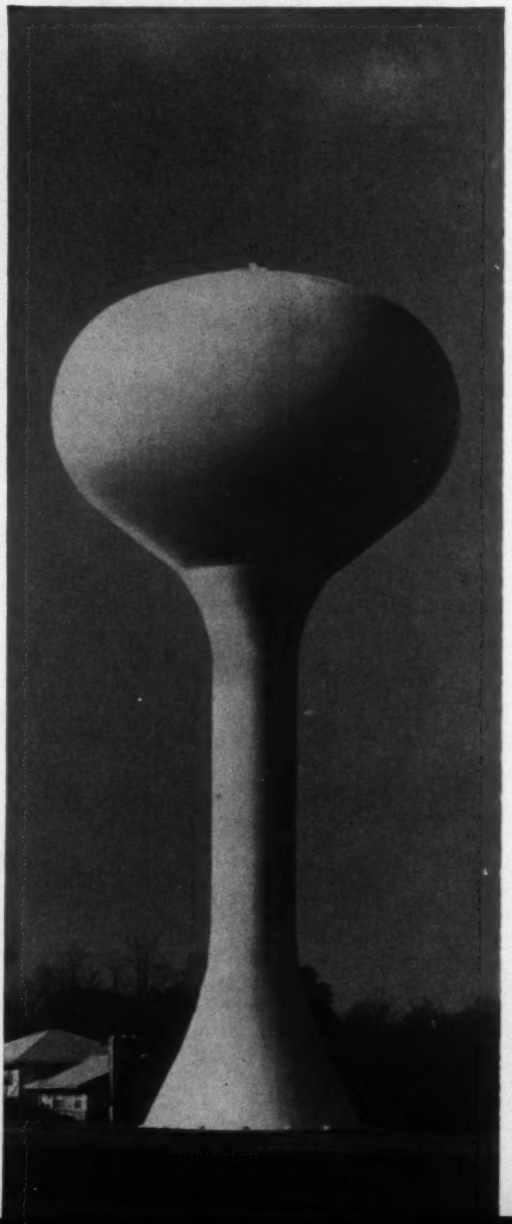


Kingman, Kansas. 500,000 gallons



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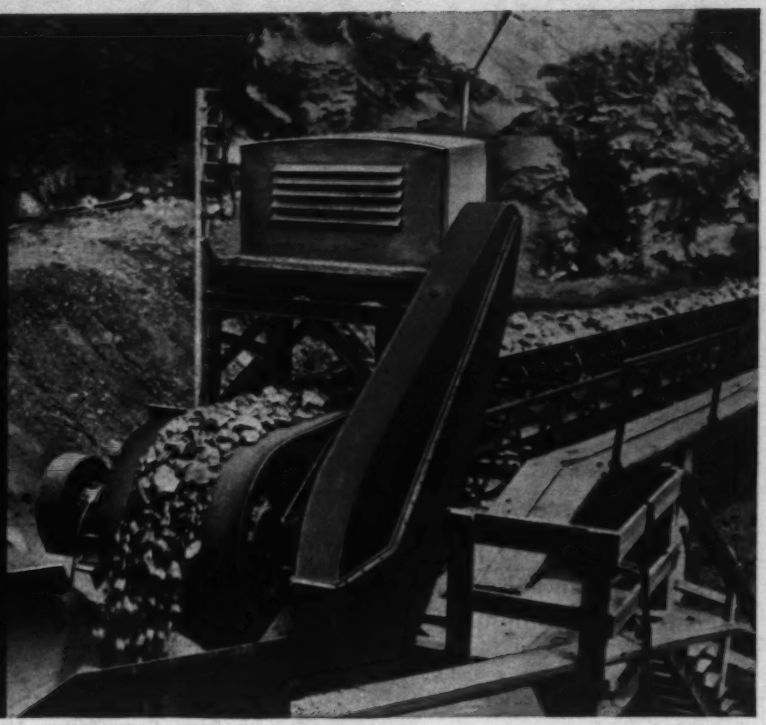

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ENGINEERING NEWS-RECORD. Vol. 165, No. 11, September 15, 1960

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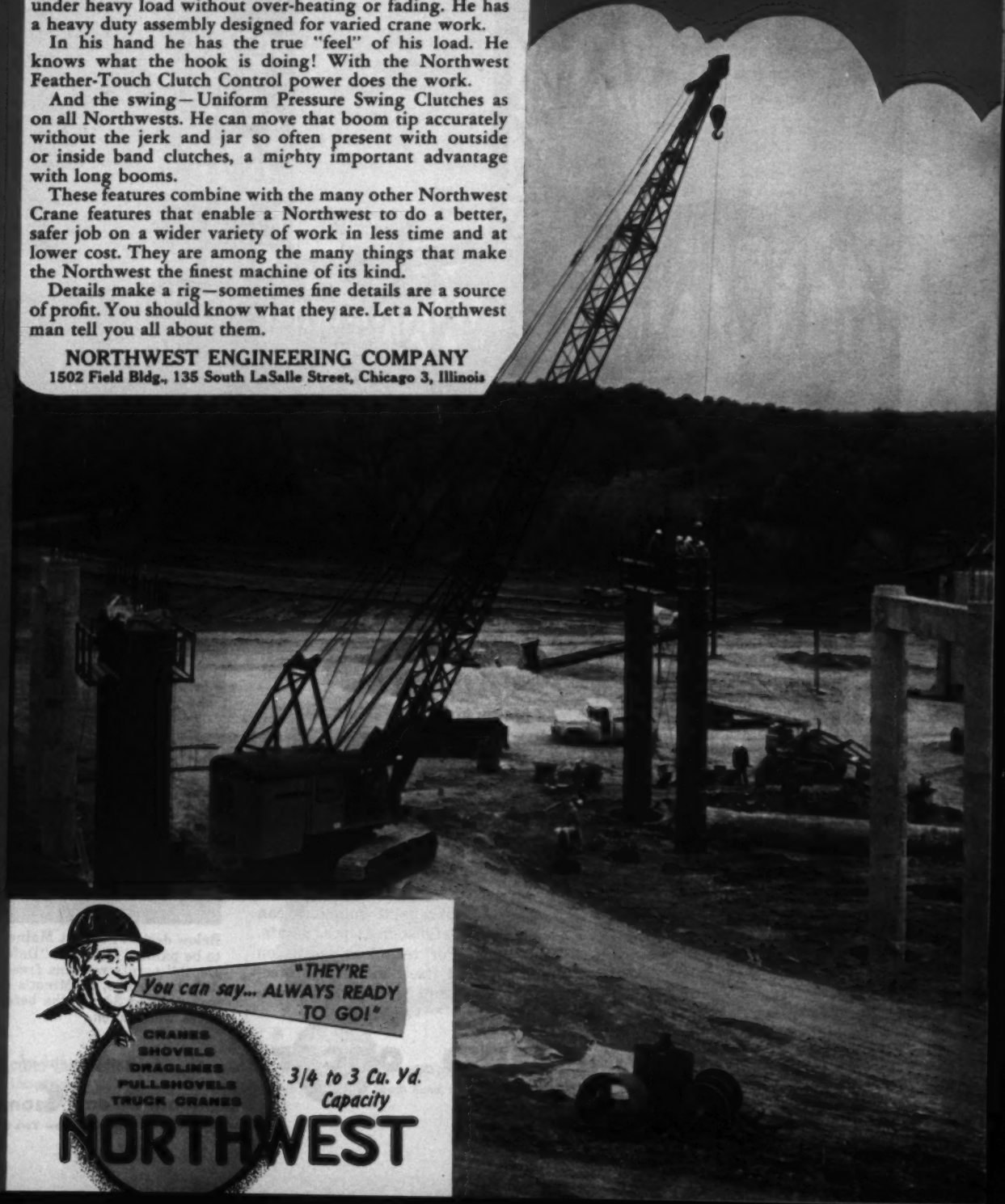

It will be years before this mile-long, double-decked highway and railroad bridge has to be repainted. Every coat of the maintenance paint now being applied contains *M50* pigment.

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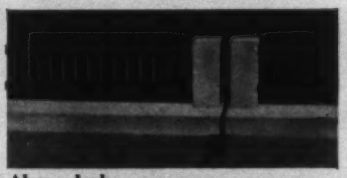

Above decks . . .

Below decks . . . First Maine bridge to be painted with *M50* "Defense-in-Depth" paints remains free of film defects. Bridge, at Minot's Corner, was painted 34 months before pictures were taken.

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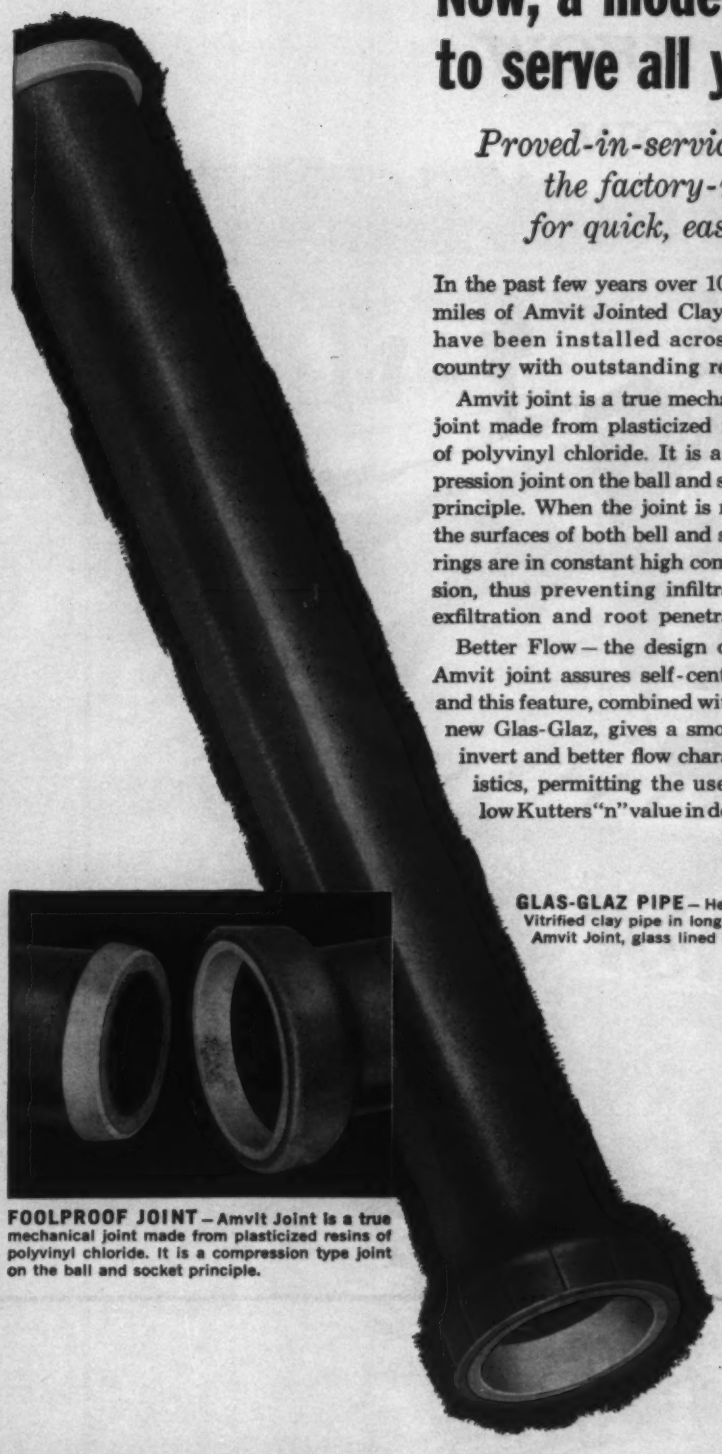

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Reader Comment

Look-Alike Hangars Are Alike

SIR—Your July 14 issue describes a large, prestressed concrete hangar just built at Santa Cruz Airport, Bombay, India, which features two 160-ft main roof girders supporting the front end of 150-ft roof shells (ENR July 14, p. 54).

Strangely enough, this hangar reminds me of another larger one which I built at Karachi Drigh Road Airport in 1943 as a resident engineer for J. C. Gammon Ltd., general contractors of Bombay, India.

The hangar consisted of two separate structural units with prestressed concrete shell roofs. Each of the two sections contained five cylindrical thin shells spanning 132 ft from *192-ft-long* prestressed concrete girders at the front to reinforced concrete columns in the rear. Chord width of the shells was 35 ft; thickness 2½ in. Rib beams between the shells, 7 ft deep by 9 in. wide, were prestressed with five cables apiece. Each cable was made up of 32 wires of 0.196 in. dia.

The 192-ft main front roof girders were I-shaped, 19 ft 6 in. deep with a maximum beam section of 3 ft 6 in. The web was 9 ft thick at the center of the span. Each of the two beams was prestressed with 28 cables made up of 32 wires of 0.196 in. dia. Expansion in the hangar roof was handled in the same way as the Santa Cruz hangar.

Prestressing of this hangar, an ancestor and a first in prestressing technique and—I believe—still a world record with its two 192-ft freely supported spans, was carried out by the Freyssinet system. The structure was designed by E. P. Nicolaides, chief engineer of J. C. Gammon Ltd., with the Prestressed Concrete Co., Ltd. (Freyssinet system) as consultants.

I worked initially for the Prestressed Concrete Co., Ltd., and was sent to India in September 1940 to supervise and direct the construction in Meirut of two large 120x420-ft open span garages with no inside columns. These buildings—the first ever to have a prestressed concrete roof of that size—were each covered with 11 prestressed concrete, 35-ft-wide cylindrical roof shells, 2½ in. thick, supported by 14 prestressed rib beams, 7 ft deep by 9 in. wide. From these garages, I went to Karachi in 1942 for the construction of the Karachi hangar.

Since the Santa Cruz hangar is almost identical in design to the one I built eighteen years ago, I wonder if the designers are not again the well-known firm of J. C. Gammon Ltd. of Bombay?

ROBERT SHAMA
Managing Director
Campenon-Bernard
Caracas, Venezuela

Editor's note: Reader Shama's eye for design is acute. J. C. Gammon Ltd. was indeed the builder of the Santa Cruz hangar.

Why Fewer Sewage Plants

SIR—May I attempt to further clarify the conclusions drawn from the statistical data in your August 25 article entitled "Sewer Jobs Increase" (p. 32).

In New Jersey, for example, the larger sewage treatment plants recently constructed cooperatively by adjacent municipalities have, at least for the moment, met requirements. I believe this fact and the tendency in some areas to make do with old plants may be reasons why construction of treatment plants for cities over 100,000 population shows a decline.

Conversely, the shifting of population in this state and the resulting new-area developments and subdivisions undoubtedly account for the increase in percentage of treatment works in cities of less than 100,000 population and new collecting system construction.

The extension of trunk lines and new lateral systems feeding central regional treatment plants, mentioned above, is probably also reflected in your data on collecting system construction volume.

While an annual comparison of contract awards for treatment plants and collection systems may have statistical value, the construction of these facilities cannot, in many instances, reach completion in one year; hence, the apparent lag between periods of large construction volume in plants and collecting systems, assuming that treatment facilities are completed first.

The growing public awareness of pollution prevention and the increased pressure from state boards of health will, I am confident, result in increased expenditures for both types of work.

LEE T. PURCELL
Consulting Engineer
Paterson, N. J.

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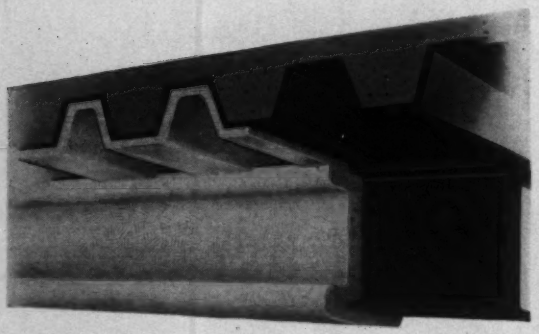

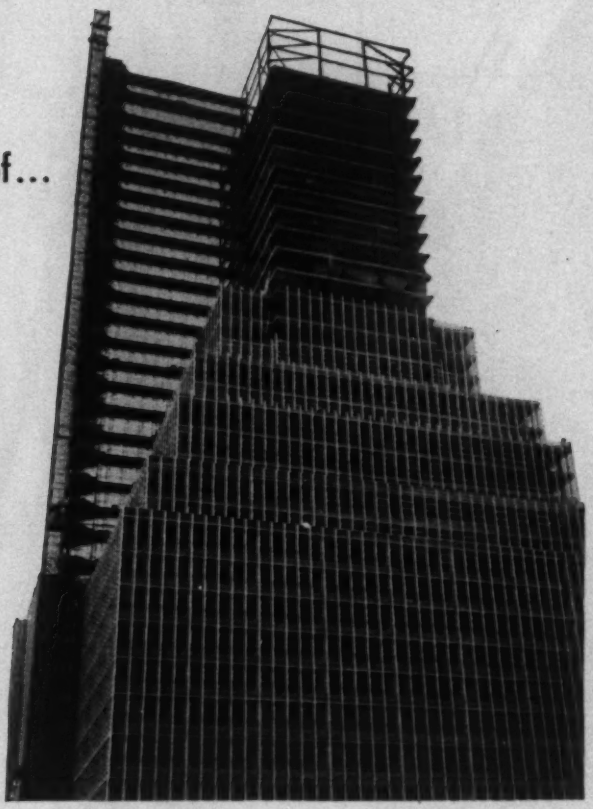

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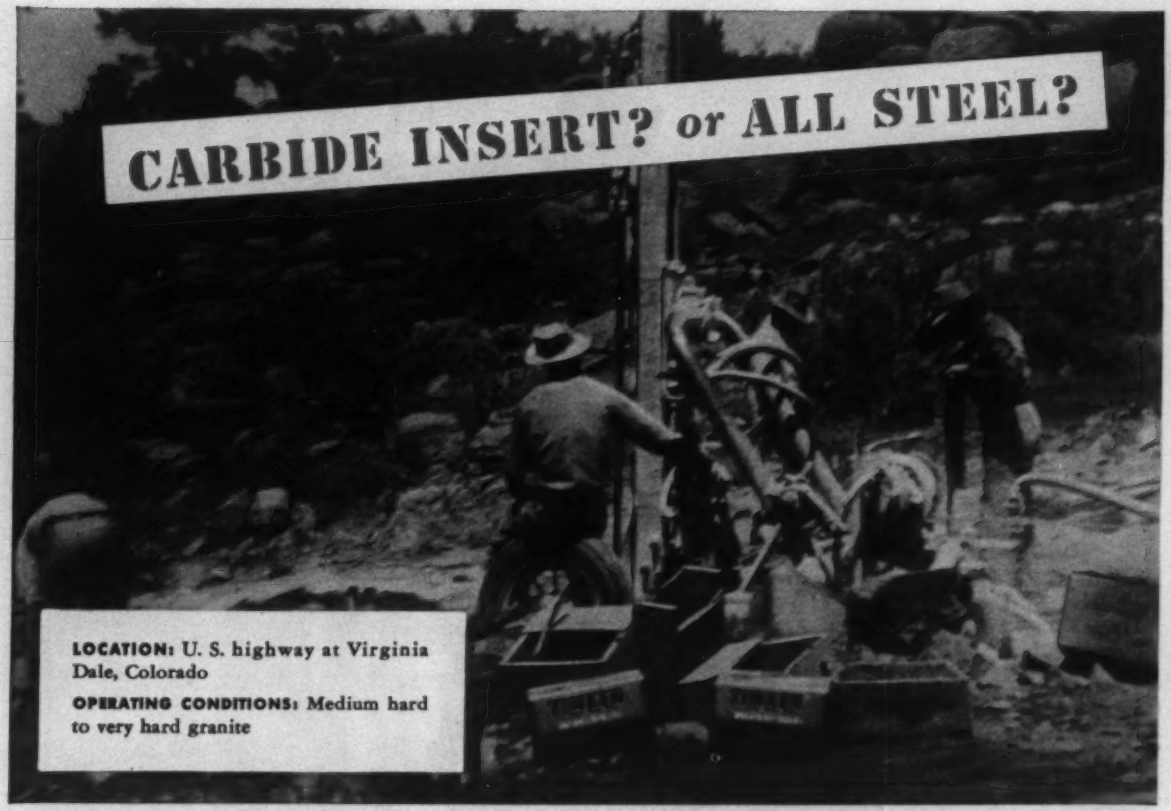
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LOCATION: U. S. highway at Virginia Dale, Colorado
OPERATING CONDITIONS: Medium hard to very hard granite

"We switch our TIMKEN® bits and drill up to 10 inches per minute in granite"

. . . Reports Northwestern Engineering Co.

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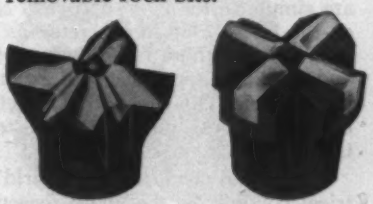

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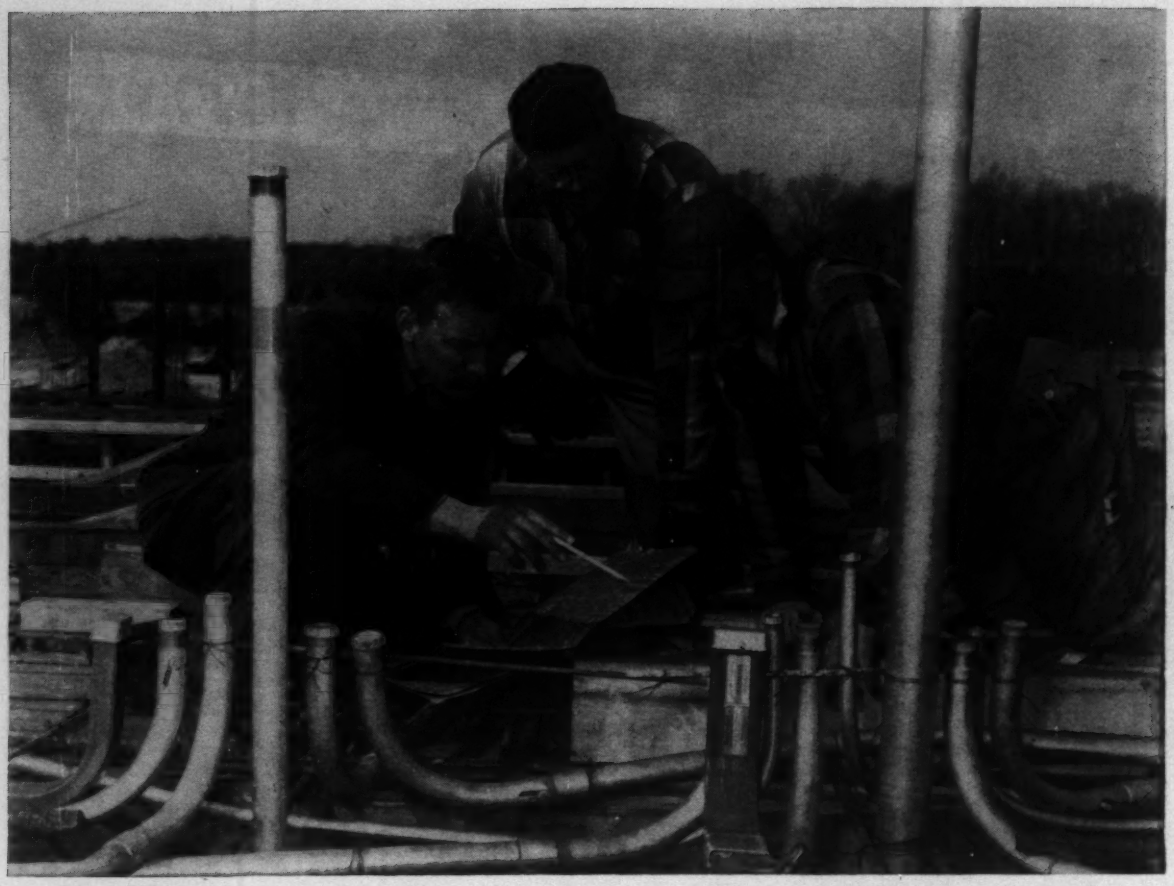

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In the $5,000,000 Southern New Jersey regional offices of The Prudential Insurance Company of America, covering more than three city blocks in Linwood, *galvanized rigid steel conduit* was specified to carry the 110, 220 and 440 volt lines needed for electric equipment, light and power.

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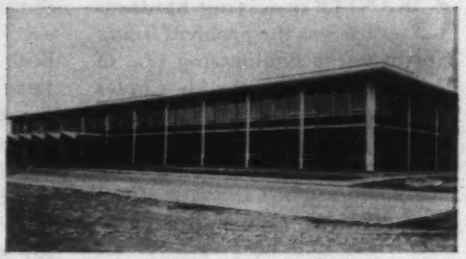

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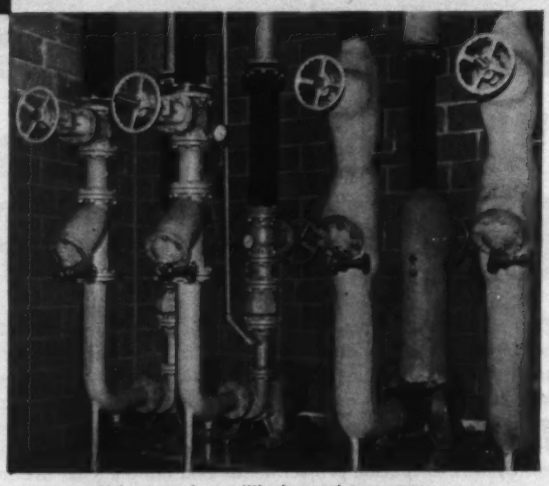

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ENGINEERING NEWS-RECORD

Vol. 165, No. 12 September 15, 1960

Number of copies printed in this issue 86,337

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THE CONSTRUCTION WEEK

COURT TEST NEXT—Massachusetts Gov. Foster Furcolo last week signed legislation amending the State Redevelopment Act so that Boston's $150-million Prudential Center will be eligible for property-levy concession. Now a contract between the city and Prudential Insurance Co. must be written. This agreement will be challenged in court by property-owner interests of the city. Until a court decision is rendered, work at the site stays in abeyance.

CONSTRUCTION FIRM ON THE BLOCK—Walter Kidde Constructors, Inc., New York City engineering-construction company, reportedly will be bought by Ebasco Services Inc. Ebasco is wholly owned by Electric Bond & Share Co., New York City Utilities holding company. Negotiations for the acquisition are expected to be completed soon.

POSSESSION, NINE POINTS OF LAW, ETC.—Morrison-Kaiser-Puget Sound-General, holders of the original construction contract for the storm-battered Hood Canal floating bridge in Washington State won't turn the project over to the contractor who got the job to modify damaged pontoons. Ubu Consolidated Industries has the $3.4-million repair and modification contract. The original holders say the Toll Bridge Authority has no right to remove them without modification or termination of contract.

A DATE WITH DONNA—An eight-man Corps of Engineers observation and survey team flew into southern Florida over the weekend to meet Hurricane Donna head on. The team will appraise storm damage and check the effectiveness of central and southern Florida flood control construction.

ZONING PLAN GETS BOOST—New York City's controversial rezoning went to public hearings this week with strong support. The Investing Builders Association, whose member firms build 90% of privately sponsored construction in Manhattan, had just expressed favor; so had the New York chapter of the AIA.

BIG THINK; BIG REPORT?—The National Academy of Sciences has given up its plan for immediate release of information on results of the five-week think session in transportation at Woods Hole, Mass. (ENR Aug. 4, p. 15). Instead, NAS will release a report next month summarizing speeches and discussions, and drawing some conclusions.

NO PAIN, NO STRAIN—Rhode Island will build a $10-million expressway through a suburb of Providence—and only eight houses and nine sheds or garages will have to be condemned. It's not always so easy (see p. 26).

PICK UP AND GO...WITH ESSO LUBES

Esso Multi-Purpose Grease H helps speed field lubrication by replacing at least 3 grease types. Gives reliable service in ● chassis greasing (helps seal out water and dirt) ● wheel bearing greasing (takes heavy loads, higher temperatures) ● water pump greasing (stays-put even in hot water).

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WASHINGTON OBSERVER

- **White House insists business is good**
- **Volta River loan of $30 million coming**
- **Bond refunds may tie up mortgage money**

● **Administration hopes for business remain high despite softness of key indicators like plant and equipment spending and housing.**

To be sure, this year is not going as Administration officials expected. For example, they forecast corporation profits of $50 billion where profits will be lower than this by several billion.

But President Eisenhower's key economic advisors still believe that the softness in business is due chiefly to a policy of close buying for inventories; they wager construction will continue good.

In their view, business is making a rolling readjustment that is disguising the robustness of broad national statistical measures, such as gross national product. They believe this is clearing the way for what could be a solid advance of business next year, instead of leading to the recession that an increasing number of private economists are talking about.

Treasury Secretary Robert B. Anderson is a leading advocate of this view. He believes the fundamental factor in 1960 is that businessmen no longer fear inflation, and no longer feel compelled to make their plans for inventory buying in the expectation that prices will rise. Once the economy is geared to this new attitude, Mr. Anderson believes, the statistics will again reflect a broad growth, this time without inflation.

—

● **Final approval of Ghana's proposed multi-million-dollar Volta river project is now almost certain.**

The U. S. has offered $30 million to help finance the first of three power dams and plants. Together with financing participation by the governments of Ghana and Great Britain, and a $45-million World Bank loan, the U. S. share probably will help provide enough long-term, low-interest aid to permit Ghana to reduce the power rate it plans to charge a private consortium of international aluminum producers for a $100-million to $150-million smelter (ENR Aug. 25, p. 82).

The U. S. has notified Ghana it would provide $20 million of the U. S. aid through State Department's Development Loan Fund, at 30-year 3½% interest terms, not tied to the purchase of U. S. equipment. The remaining third would be handled by the Export-Import Bank at 5¾% interest and tied to U. S. purchases. Ghana had asked for the entire $30 million through the loan fund.

—

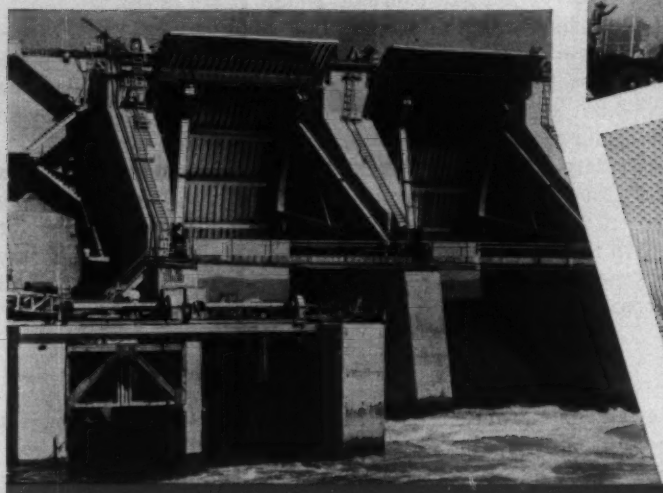
● **The Treasury's advance refunding operation may reduce the amount of money that otherwise would be available for public works bond issues and housing mortgages.** But the effect, if any, will be slight and will be spread over the next seven to ten years.

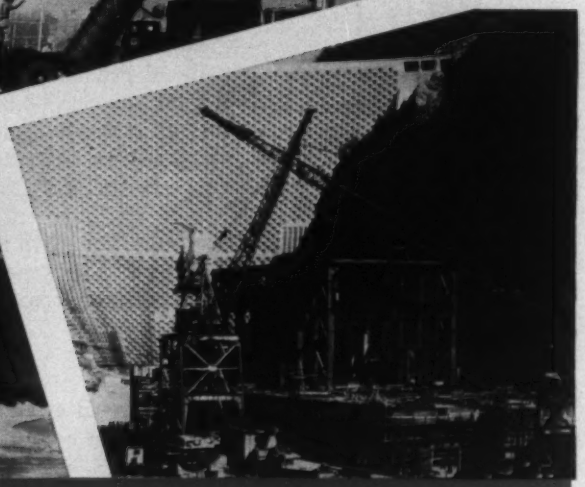
In the refunding, holders of World War II bonds maturing in 1967 and 1969 are given the option of exchanging them now for new, long-term bonds. To the extent the offer is accepted, it will mean the tying down of money that otherwise might gradually have worked its way into public works bonds or home mortgages as the World War II bonds approached maturity.

Treasury officials are making the advance refunding offer so as to extend the average maturity of outstanding U. S. Dept.

GOING UP!

THE BIG
THE TOUGH
THE EXACTING
...ALL ROUTINE FOR YUBA





Typical jobs show wide scope of another Yuba service: Equipment Installation and Field Erection

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Whatever your equipment installation needs – wherever the site – get in touch with Yuba. Your call will swing experienced Yuba crews into action from dispatch points across the nation.

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Primitive distribution is target in ICA campaign to sell idea that . . .

Piped Water Is Worth Paying For

Underdeveloped countries can finance adequate piped water supplies for their homes and industries themselves—and to do so would be the best investment they could make to assure the higher standards of living they so widely seek.

That is the message the International Cooperation Administration's Office of Public Health is trying to get across to the emerging nations of Africa and Asia and to the underdeveloped countries of South America. It represents a reorientation of foreign aid philosophy in the field of public water supply.

"The potential result: Greatly increased progress at infinitely less cost to the U. S."

In his request for a $2-million appropriation this year, OPH director Eugene P. Campbell outlined the significance of his office's new philosophy:

"The requirements of the underdeveloped countries of the world for adequate community water supplies are so vast in total that no conceivable program of external grants and loans of technical and material resources could reduce them significantly. Water supplies can, however, be developed on a self-liquidating basis by any country that wants to make the effort. There is convincing proof that the effort is worthwhile and there are practicable methods of finance, design and construction that can make the effort successful. ICA, working through its own staff of sanitary engineers and its sanitary engineering consultants, can provide this proof and point the way to these practicable methods. Through such a program of technical assistance, at a truly modest cost, the U. S. can make a major contribution to the overall objectives of our foreign aid operations."

The new ICA viewpoint is based on these few precepts:

- The philosophy that water should be essentially free to the consumer is false and self-defeating.
- Municipal water supplies in underdeveloped countries should be considered utilities, the same as electricity and telephones, and should be planned and operated on the theory that the user will pay the full cost of the service.
- Water can and should be delivered in pipes—to keep it pure and potable; and to direct the labor expended in carrying water in head jars or carts to more profitable ends.
- Upgrading municipal water supply to at least minimum modern requirements, including pipe distribution, is a necessary preliminary to industrial development—it will provide process water and free the labor force from enervating water-borne diseases.
- Water supplies can pay for themselves and must be planned with that end in view if the vast needs of communities in underdeveloped countries are ever to be met.

With these precepts as a base, OPH has developed what it calls a Community Water Supply Development Program. To aid in carrying it out the World Health Organization last year was allotted $300,000 from OPH's initial $1 million appropriation, and the Pan American Health Organization was allotted $200,000. A similar sharing of the funds and responsibility is a continuing feature of the program as it develops further.

The idea for the Community Water Development Program was conceived in 1958 following a resolution by the 88-nation General Assembly of the World Health Organization favoring increased emphasis on community water supply efforts (ENR July 23, 1959, p 26).

Most of the guiding precepts, and particularly the two basic ones—piped supplies and self-liquidation through user charges—were laid down at that time. Subsequently, in 1959 and again in 1960, similar advisory panels were convened to re-examine the objectives and offer suggestions for improvements in operation. "Sales" emphasis is now placed on the economic benefits of adequate community water supplies rather than on the obvious health advantages. The necessity for good business management is stressed as a prerequisite to attracting investment capital for improving existing supplies and developing new ones.

Loans and grants for water supply purposes have, of course, been a part of U. S. foreign aid from the beginning in 1942, when the Institute of Inter American Affairs began operating in Latin America. In the later expanded program projects have been carried out in two dozen or more countries, from Brazil to Thailand, and the separate systems involved number in the several hundreds. Most of these projects have emphasized construction.

In contrast, this new program is focused on waterworks operation, management and amortization of costs. It involves no construction grants—the offered help is strictly of the technical assistance variety.

OPH told Congress: "The purpose of this program is to assist countries to develop or strengthen business-type, self-sustaining national institutions which will plan and aid financing, construction and management of water supply systems at the community level."

(*Turn the page.*)

FOREIGN ENGINEERS learn about groundwater development at an ICA school.

To carry out the program, the organization will:

- Provide consultation on planning, organization, management, technical, legal and fiscal matters.
- Develop human resources through education and training programs.
- Upgrade capabilities of national personnel through seminars, dissemination of information and development of manuals.
- Make limited grants to pilot projects.
- Aid countries in sound fiscal planning, essential to preparing requests for external loans.
- Encourage use of national and foreign private engineering firms and local industries to meet the countries' needs.

There has been progress to date in each of these categories. For example, a training course in groundwater development, attended by 45 students from 22 countries, was held at the University of Minnesota in 1959, and a second, with an attendance of 36 from 26 countries, was held this summer. A seminar for Eastern Mediterranean countries on the problems of promoting and financing water supplies was also held in Amalfi, Italy, in 1959, and plans are under way to conduct more such seminars in Costa Rica, Brazil, Uruguay and India, as well as at two Far East locations and one in Africa.

Another training activity has involved U. S. sanitary engineers stationed with ICA Missions in Latin America, who were brought to the U. S. Public Health Service Sanitary Engineering Center in Cincinnati last spring for briefings on the new program and to take a course in water system management.

Five technical manuals are being produced to aid staff men stationed abroad, and to guide foreign country personnel. These will document good practices to follow in water supply development. The first manual, on financing, has been completed.

Carrying out the policy of making consultants available on specific request, ICA sent a team of three sanitary engineers to India this year to advise on the water supply and sanitation phases of that country's third five-year development plan.

A total of 22 countries has asked for such guidance and help, including Ceylon, Costa Rica, Ecuador, Peru, Brazil, Korea and Yugoslavia.

Special studies have also been made of the water supply situations in Ceylon, Yugoslavia, Costa Rica and Puerto Rico, with others in progress at the present time.

The development of the island-wide Puerto Rico Water Resources Authority is of particular importance since it has had a significant influence both on the economic development of the island and on decreasing the incidence of diarrheal disease. In the 15 years since the Authority took over the 75 water systems of the island, the number of water connections increased from 70,000 to 236,000, and the percent of metered supplies rose from 43 to 89. Water revenues went from about $1 million to $7.35 million. In about this same period, deaths from diarrhea and enteritis declined from 480 per 100,000 to 62. Industrial development has shown the same kind of improvement. The Authority's industrial customers have increased from 371 in 1949 to 1,498 in 1959. The system is completely self-supporting from water revenues.

Puerto Rico is an example of what ICA envisions for many other countries, although the pattern will vary depending on the size and stage of development in any particular country.

Bridge Builder Sued Over Failure of Sheet Piling

Merritt, Chapman & Scott Corp. of New York City and Intrusion Prepakt Inc. of Cleveland have been named defendants in a $750,000 damage suit filed in a Federal District Court by the Mackinac Bridge Authority. The suit stems from the alleged failure of about 260 lin ft of the steel sheet piling encasing the south anchorage of the $100-million Mackinac Bridge.

The sheet piling, which during construction served as a form for the concrete in the anchorage base, was left in place as protection against scour and ice.

In the fall of 1958 the failure of one fabricated corner sheet was noted but weather prohibited correction of the difficulty. By spring of 1959 ice had forced the 100-ft-long sheeting away from the concrete, causing it to fold at the strait bottom some 30 ft above its toe.

Repairs to the sheet pile wall, now almost complete, required removing the damaged sheets, resetting and reanchoring new sheets away from the anchorage, and casting additional concrete between the original anchorage concrete and the new sheet piling.

The bridge authority claims that the defendant contractors were negligent in constructing the anchorage and should therefore pay for the cost of repairs. Attorneys for the contractors have not yet filed a formal reply. Unofficially, company spokesmen say that all work was done in accordance with specifications and the work was accepted by the authority when the job was completed three years ago.

Water Pipeline to Link Canadian, American Towns

A pipeline across the Canadian-American frontier will carry North Dakota water to the town of Altona in the province of Manitoba. The pipeline will be between 10 and 15 miles long.

Officials of Neche, N. D., and Manitoba have signed an agreement making construction of the international pipeline possible.

Citizens of Altona have voted in favor of a $223,400 water-distribution system for the town, thus making possible a call for bids on the pipeline project.

Manitoba has appropriated $525,000 for the pipeline job, and it is also accepting bids.

Gretna, one-half mile north of Altona, may also cash in on the pipeline benefits if its citizens accept plans for a $156,000 water and sewer system. Should the measure pass, a short spur will be built from the main pipeline to Gretna.

Fort Pitt Tunnel Opens; Speeds Pittsburgh Traffic

Pennsylvania highway officials have dedicated and opened to traffic the twin-bore Fort Pitt Tunnel in Pittsburgh.

Under construction for three years, the $13-million, 3,600-ft tunnels connect directly to the two-level Fort Pitt Bridge and tie together the eastern and western sections of the Penn Lincoln Parkway. Each of the twin tubes carries two 12-ft traffic lanes (ENR Jan. 16, 1958, p. 34).

The tubes have the same elevation at the south portal. At the north portal, they are at different levels to match the two decks of the bridge.

Merritt-Chapman & Scott Corp., New York City, is the general contractor. Michael Baker, Jr., is the consulting engineer.

Completion of the tunnel as an express connection to the bridge solves only one half of the problem of handling traffic at the Golden Triangle, the point between the Allegheny and Monongahela Rivers. The bridge over the Allegheny and the interchanges between the two bridges remain to be completed.

Los Angeles Sets Specs For Rooftop Heliports

Los Angeles has set a mark for other city governments by adopting regulations specifying both construction criteria and situation of rooftop heliports (ENR Oct. 1, 1959, p. 23).

The ordinance outlines requirements for platform or roof support based on helicopter weight. In the ordinance, helicopters are placed in four categories by weight to a limit of 20,000 lb.

Other sections of the ruling cover these points:

Touchdown areas must be a minimum 20x20 ft for the smallest 'copters and at least 60x60 ft for the largest.

Markings must include the weight limit of the platform placed where clearly visible to pilots in the air, plus a 1-ft-wide border around the edge of the landing area.

City-approved fire-protection facilities—standpipes, extinguishers, alarms—must be maintained at the pad.

Parapet walls or railings at least 36 in. high are required around the area.

At least two exits—remote from each other—must lead to the floor below from the landing area.

Surface of touchdown areas "shall be covered with an impervious and noncombustible material," according to the design provisions.

Lighting for all the night landing pads must meet Federal Aviation Agency regulations.

Another Dish For Planet Study

When mounted on its carriage this aluminum dish will rest 150 ft above the ground, ready to be pointed at any sector of the sky. The 150-ft-dia radar telescope reflector is nearing completion on the Stanford University campus near Palto Alto, Calif.

The dish weighs about 115,000 lb and has a reflecting surface of almost half an acre. It consists primarily of prefabricated and welded aluminum members and mesh.

A million-watt transmitter will "feed" the antenna, which will bounce signals off the sun, moon and nearby planets for research purposes. Scientists from Stanford University and Stanford Research Institute will share the facility. It is being built under contract with the Air Force Cambridge Research Center.

Prof. Allen M. Peterson designed the telescope. Bigge Crane & Rigging Co., San Leandro, Calif., put together the $250,000 steel and aluminum parabola for the telescope.

St. Louis Votes Sewerage Plan

Voters from both northern and southern St. Louis County have approved separate bond issues totaling more than $15 million for trunk sewers and a sewage treatment plant.

Metopolitan St. Louis Sewer District got the go-ahead from citizens in two different watersheds simultaneously at special elections held late last month. MSD can now proceed with two major programs aimed at helping to end the massive pollution of the Missouri-Mississippi basins—prime target of the U. S. Public Health Service.

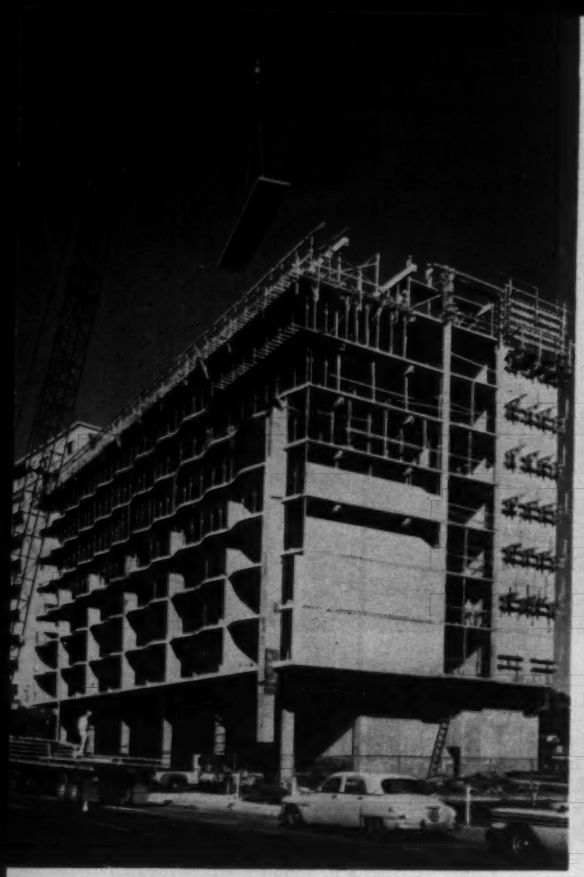
The two projects involved will eliminate the discharge of raw sewage via open sewers into the Gravois and Coldwater creeks. The Gravois Creek trunk line—a 12.7-mile sewer costing $4.75 million—will convey all sewage now discharging into the creek to a point on the Mississippi River where MSD plans one of several large treatment plants.

The Coldwater Creek watershed is the only drainage basin within the district that flows directly into the Missouri River. To meet PHS demands it will get not only a trunk sewer 12 miles long, but also a treatment plant will end the discharge of raw sewage into that stream. Cost of this project is estimated at nearly $11 million.

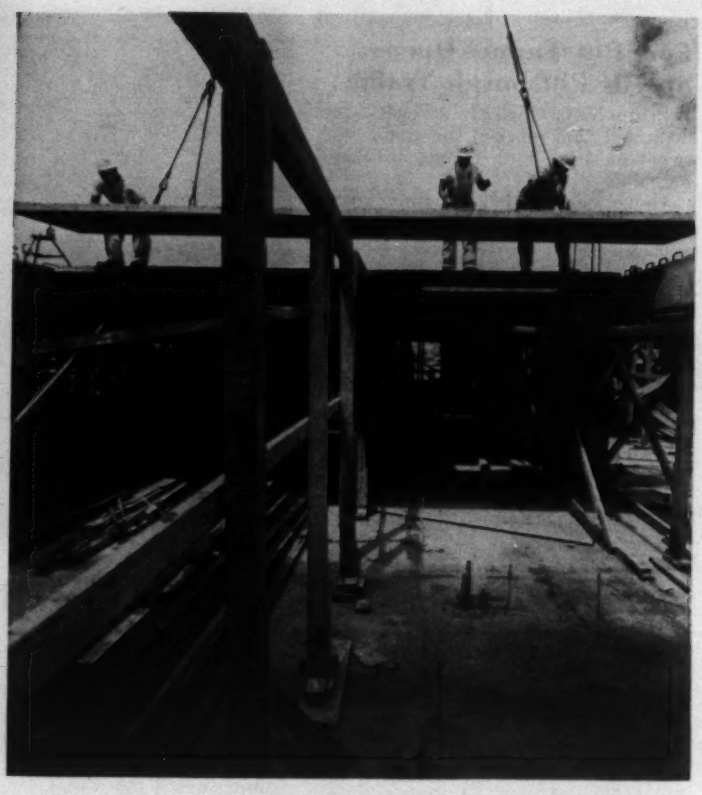
St. Louis is one of five Missouri-Mississippi Basin cities under pressure by PHS to curb pollution of the rivers. St. Joseph, Mo., faces court action for failure to comply with the Federal schedule of pollution abatement (see editorial p. 116).

Omaha, also on the PHS list is voting November 8 on a $10.7-million bond issue for a sewage treatment plant. Sioux City, Iowa, and Kansas City, Mo., are both under orders from the PHS to build sewerage facilities.

The Missouri and Mississippi basins are getting attention from the Public Health Service before other river basins, according to a spokesman for the agency, because the two rivers are among the few major basins left where big cities and industrial plants still discharge raw wastes into waters used for domestic supplies by cities downstream.



Hotel's precast floor slabs . . .



Go into place on a single line of temporary shores.

Hotel Superstructure Goes Up in

Column steel forms connection—later grouted—with beams.

Rushing to contain the flood of summer tourists, Hawaiian builders erected a 12-story hotel superstructure in three months.

Sheraton Hotels of Hawaii—a subsidiary of the Boston-based Sheraton Hotels chain—bought four Waikiki Beach hotels in August, 1959. One look at the travel predictions for this year produced a fast decision: Build and build fast to expand the tourist capacity.

Construction work began in November; superstructure work began early this spring. This first major expansion added 210 rooms to the Princess Kiaulani Hotel. Major considerations were time, cost and a shortage of carpenters.

This meant a substantial structural design that would go up fast with a minimum amount of forming work at the site. The final design: a combination of cast-in-place columns, precast, prestressed slabs and beams together with a combined fill and topping.

Floor slabs were designed in 16- and 20-ft lengths with a standard 4-ft width. Short lengths were stressed with five $\frac{3}{8}$-in.-dia strands, the longer ones with eight $\frac{3}{8}$-in.-dia strands. Stress in both

Columns and cement finish are cast together to speed work

Just Three Months

cases was 14,000 lb. Beams were 10 x 16 in. stressed with seven 7/16-in.-dia strands at 18,900 lb. each.

Concrete specifications called for 28 day strengths of 6,000 psi for all prestressed elements and 4,000 psi for the floor topping. Columns were 5,000 psi on the lower floors and 3,000 psi on the upper floors.

The first timesaver in superstructure construction was the slipform method used for the elevator tower (ENR Aug. 25, p. 56). The entire shaft—14 levels from foundations to machinery penthouse—went up in 16 days.

Stiffness was a major consideration in the slab design. As column forms and precast beams went up, a single line of 4 x 6-in. timber shores was erected on the centerline of each bay the length of the building. The shores were just high enough to carry the weight of the floor slabs while crews placed 3 in. of topping. Top steel was added in the combined fill and finish, where slabs butted over floor beams to provide the maximum degree of continuity over supports.

The architects report that when the shores were removed, there was no measurable deflection at midspan despite the long spans.

The precast, prestressed slabs and temporary shoring paid off in several ways. Construction time was cut by eliminating floor slab forms; and limited slab deflection provided a better soffit.

Workmen placed concrete for the columns and topping for the floors at the same time. Beams were precast with a pair of vertical holes at each end. On the job, steel workers threaded column reinforcing through the holes and with column concrete cast, finishers filled the connections with non-shrink grout.

Workmen completed the superstructure by the beginning of May and interior finishing was done in time to open the hotel for the peak of the tourist season at the beginning of July.

Architect for the project was Wimberly and Cook, Ltd., Honolulu. Haas & Haynie, San Francisco, was the general contractor. Concrete Engineering Co., Honolulu, produced the precast, prestressed components.

The addition is the first step in a $14-million expansion program by Sheraton in the Honolulu area.

Curtain Wall Apartment Has No Back-up Wall

A steel curtain wall without masonry backing will enclose a new 20-story apartment building in Newark, N. J.

The walls are of prefabricated sandwich construction. Exterior steel is porcelainized; the interior panel of painted steel will form the apartment walls. Between the two panels is a soft-pad fiber glass.

The structure, now under construction, also will feature galvanized steel sash that extends from floor to ceiling on all floors above the entrance level. The sash will frame the panels, and both fixed and movable glass windows.

The building, Weequahic Tower, will have 205 apartments and underground parking for about 70 cars.

Romolo Bottelli, Jr., Maplewood, N. J., is the architect. The builder is Arthur H. Padula of Newark, N. J.

Consultants Detail Plans For LA Rapid Transit

Consulting engineers Daniel, Mann, Johnson & Mendenhall have submitted a final technical report on rapid transit systems, routes and costs to the Los Angeles Metropolitan Transit Authority.

The report gives details supporting DMJM's previous recommendation of rubber-tired electric trains, to run mostly overhead, without subway (ENR July 7, p. 24).

The final report also describes an alternate route, partially underground. The alternate plan includes routes generally close to those recommended previously. Both go out from the central business district to Covina, Santa Monica, Long Beach and Reseda. Major difference is in the amount of elevated, surface and subway mileage proposed.

The recommended system would be 74.9 miles long—51 miles overhead, 21.6 miles at grade, and 2.3 miles in a tunnel. It would cost $529 million.

The alternative route would be 73.6-miles long—56.7 miles overhead, 4.6 miles at grade and 12.3 miles of subway. It would cost $614 million. Costs also were estimated for suspended and supported monorail systems.

The consultants also gave cost estimates for each of the three systems along the alternate routes shortened to a total of 49 miles, terminating at El Monte, West Los Angeles, Compton and North Hollywood. This system is estimated to cost from $381.5 million to $460.5 million for rubber-tired equipment.

The Transit Authority has hired Coverdale & Colpitts, New York consultants, to carry out an economic feasibility study this fall. The study is to be completed in 90 days. Cost of the study is not to exceed $25,000.

FPC Weighs Rival Snake River

Detailed plans for two huge, rival hydro-electric projects in the Pacific Northwest were revealed when backers of the High Mountain Sheep and Nez Perce dams filed their direct written testimony and exhibits with the Federal Power Commission.

Chief points in the competing applications include questions by High Mountain Sheep backers as to whether Nez Perce was safe either structurally or for migratory fish passage; and claims by both Nez Perce and High Mountain Sheep supporters that their particular plans would be more economical to build and operate, and more beneficial, in the long-run, for the Pacific Northwest.

High Mountain Sheep Dam is proposed by Pacific Northwest Power Co. (made up of Montana Power, Washington Water Power, Pacific Power & Light, Portland General Electric); Nez Perce is proposed by Washington Public Power Supply System (composed of about 40 public utility districts and electric co-ops in Idaho, Oregon and Washington).

The High Mountain Sheep application was filed with the FPC more than a year ago—after an earlier "two dam" plan for Mountain Sheep and Pleasant Valley was rejected—and FPC hearings had been scheduled this spring. But a last-minute filing by Nez Perce backers delayed that hearing until the two conflicting applications could be consolidated this fall into one hearing.

The FPC hearing procedure is a departure for electric power cases, although common for natural gas cases. Under this procedure, direct testimony for the two rival plans was filed September 2, intervenors and the FPC staff will file their testimony on September 19, and hearings—limited to cross-examination—will begin Oct. 17.

No FPC presiding examiner has been picked, but a good bet is William J. Costello, who refereed the controversial Hells Canyon case several years ago. The examiner may not be picked until a week or so before the cross-examination hearings begin.

Structural safety of the Nez Perce project was raised by Charles C. Bonin, engineering manager for Ebasco Services, Inc., New York City consultants for WPP, who pointed out that "numerous small, steeply dipping faults are common to the (Nez Perce) site. Where the dam abuts a narrow nose of rock on the right bank, considerable doubt exists as to its soundness and safety because of the adverse dip on the bedding planes toward the river. Because of uncertainties regarding the quality of the rock, it is recommended that a gravity dam would be a more prudent choice than an arch" as proposed by the Washington Public Power group. (It should be noted that the Nez Perce Dam site already has been moved about 500 feet downstream on the Snake from the original Corps of Engineers site to avoid a more serious fault zone).

Mr. Bonin emphasized that "both the High Mountain Sheep and Lower Canyon sites are unusually attractive and favorable for arch dams, because of the deep 'V' canyons in which they are situated, the extremely hard granite formations that are firm and solid on the abutments, and the absence of faults. The arch dams as designed are fully competent, safe and durable."

The Lower Canyon Dam is a second project which PNP proposes to build at a future date across the Salmon River, just above its confluence with the Snake.

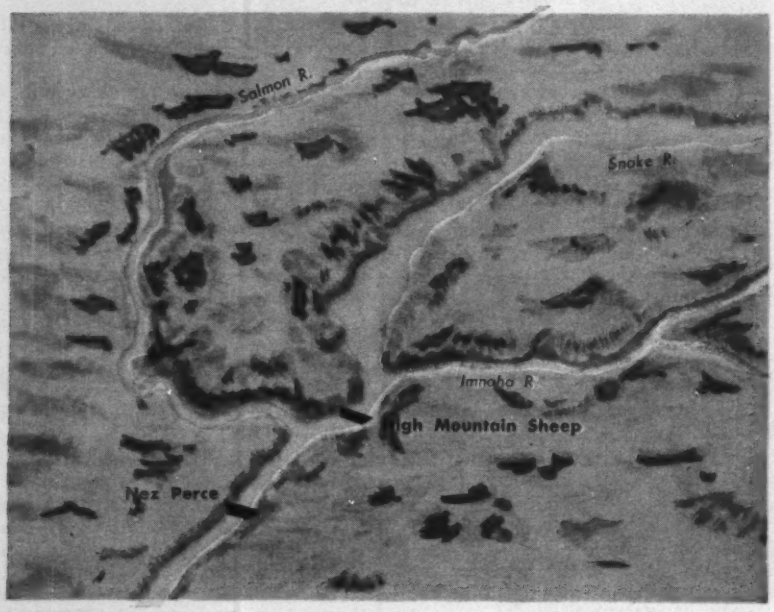
An assurance of Nez Perce's structural safety was made, however, by Arthur P. Geuss, vice president, of Harza Engineering Co., Chicago, PNP's consultants. He said "the structures proposed for the Nez Perce project will be stable and safe . . . The foundations for the several structures of the Nez Perce project are adequate with proper and customary treatment to assume a safe and stable structure from a design standpoint." Two other Harza engineers testified further that the Nez Perce site is geologically adequate for the 700-ft dam, and that its arch design is safe and stable.

High Mountain Sheep testimony also hit the proposed migratory fish facilities at Nez Perce. A Pacific Power & Light biologist charged that, "based on present knowledge, the large runs utilizing the Salmon River could not be preserved if either Nez Perce or Lower Canyon are constructed. Nez Perce presents problems more complex than either Lower Canyon or High Mountain Sheep."

The scientist emphasized that the Nez Perce site would mean handling fish from all three rivers—Salmon, Snake, and Imnaha—this compounding the still unsolved problem common to Nez Perce and the proposed 723-ft Lower Canyon Dam—providing adequate fish passage facilities for dams of this height.

The newly proposed Nez Perce fish facilities—developed since the license application was filed in March—calls for a full-river-width fish attraction system for upstream migrants, a 270-ft ladder, plus a double pressure chamber to put the fish through the dam at about 500 ft depth. An "up and over" fish ladder could be added, if the pressure chamber wasn't suitable.

Downstream migrants in the Salmon River would be trapped by a louver device at the Whitebird Dam site. Here fingerlings would be trapped and barged downriver, and sent over the dam by means of a helical chute. Downstream Snake River fish would



COMPETING SITES, only three miles apart, have river mouth between.

Hydro Plans

be accepted as delivered from Idaho Power Co.'s upstream Hells Canyon dams, while Imnaha fingerlings would be trapped in a skimmer device, and also barged downstream.

Nez Perce fish facilities are "technically sound," testified another Harza engineer, who added, "all features . . . have been hydraulically and biologically tested and/or adequately proven in operation as to their capabilities." Another fish expert, Harlan Holmes, testified in favor of the Nez Perce plans.

No conservation group has commented on the Nez Perce fish plans, but the critical part of the plan—the Salmon River louver system for downstream migrants—was called "97% efficient in tests" by Nez Perce backers.

Nez Perce fish facilities will cost about $28 million, while High Mountain Sheep facilities would cost about $19.7 million. Less concern for fish at High Mountain Sheep is due to the smaller number of migrants involved, plus the fact that the Snake already has several large dams either built or under construction along its stretch above the High Mountain Sheep site.

Nez Perce altogether would cost an estimated $473 million, construction accounting for $348.5 million. Transmission lines are expected to be built by Bonneville Power Administration and aren't included in the present application. Also left out of the Nez Perce application is an added 70,000-kw power plant at the Whitebird Dam site, upstream on the Salmon where the louver fish facility would be built.

Nez Perce would be 700 ft high, require 2.5 million cu yd of concrete, store a usable 4.7-million acre-feet of water and generate a maximum of 3,360,000 kw of power. Power would be generated by an ultimate of 16 generators rated at 210,000 kw each.

The $166-million High Mountain Sheep plan calls for a dam 670 ft high, maximum generating capacity of 2 million kw and 3.1 million acre-ft of usable storage.

However, PNP applicants point out that High Mountain Sheep should be considered only in conjunction with the future Lower Canyon Dam, to be competitive with Nez Perce. The two dams combined would cost $257.1 million and generate a maximum of 3.4 million kw. Combined usable storage capacity would be 5,515,000 acre-ft.

Transmission lines for High Mountain Sheep would be built by Pacific Northwest Power, costing $66.2 million. No estimate is given for future lines, or fish facilities, at the Lower Canyon site.

Around the World . . .

• **Mixed results**—Results of Des Moines' experiment in combining what formerly would have been a number of small jobs into one large-scale (nine miles) residential street paving project were mixed—disappointing because only two bids were received, encouraging, because unit prices were down. Large firms said timing of the bid call was bad, but expressed interest in future projects.

• **Tunnel bids coming**—Bids will be opened next month for reconstruction of Yerba Buena Tunnel portion of the San Francisco Oakland Bay Bridge. The work is part of a $35-million project to provide five lanes of one-way traffic on each deck.

• **Second chance**—Boston eventually may get its long-planned, $100 million government office center. Gov. Foster Furcolo has signed a measure authorizing $50 million worth of state office building construction in Scollay Square. Boston has authorized a new city hall complex and the federal government has indicated it may put up a $30-million building. Previous legislation authorizing the center was ruled unconstitutional.

• **Fair Code**—New York's World's Fair will not be constructed under the city's building or health codes if two measures introduced in the City Council last week are passed. The proposed building code will be more liberal than the city's; it will permit new materials and construction without decreasing safety. The proposed health code for the Fair follows existing city rules.

• **Skoal!**—An Arkansas store and service station owner is suing a Little Rock contracting company for $43,250 because a "landmark" artesian water well stopped flowing after the company blasted nearby. The store-owner says many persons did business with him to have a drink, of the "ever present" water that was "cold and refreshing."

• **Dam inspection by TV**—The Tennessee Valley Authority soon will begin using skin divers and closed circuit television to inspect underwater sections of dams and spillways. The agency tested the technique last year and has now ordered equipment (TV is now being used for underwater inspection at the Hood Canal Bridge see ENR Sept. 8, p. 26).

Air Force Repaves With Asphalt

The contractor will complete work this week on reconstruction of a heavy duty asphaltic concrete center keel in the 4,636-ft center section of the main north-south runway at Tinker Air Force Base near Oklahoma City.

The keel is 16 in. thick and 60 ft wide.

Air Force spokesmen say selection of asphaltic concrete for this project does not reverse the ban on the material for newly constructed center keels at bases serving B-52 bombers and other heavy aircraft. No such new runways have been built in the U. S. since the policy was established.

The original runway was built in 1942. It was a 6-in. portland cement concrete pavement laid on natural soil with very little subgrade preparation. Elastic soil and increased numbers of heavier aircraft led to deterioration of the pavement, which was resurfaced in 1955.

The 1955 resurfacing consisted of 12 in. of select granular material with 4-in. asphaltic concrete surface course. Water trapped in the granular base course and operational characteristics of current Air Force aircraft, which concentrate their weight in a narrow strip down the center of the runway, resulted in substantial structural damage.

Strategic Air Command B-52 bombers and KC-135 tankers are flown to Tinker for repairs and modification. But they are usually lighter than those at an operational base and equipped for combat.

Asphaltic concrete was selected in preference to other pavement types because Tinker officials felt its construction characteristics fit in best with the time schedule of base operations.

The project is being done in three 16-day phases. Arrival and departure of SAC aircraft are scheduled between phases. Base officials feel that asphaltic concrete will bond well to the old concrete pavement and seal off surface water.

Amis-Kelly Construction Co. of Oklahoma City has a $209,000-contract for the work.

WRONG — Poorly located expressways cut up neighborhoods, civic centers, shopping areas.

Interstate Highway Construction

Joseph F. Wilkinson

The federal government will spend some $20 billion on what can become one of the greatest tools for revitalizing our cities.

The money will go to build the urban sections of the National System of Interstate and Defense Highways, 5,000 miles of expressways in 90% of all cities of 50,000 or more population.

Urban expressways are the skeleton of a city, the framework around which it grows and lives. Intelligently located and designed, they can invigorate the economic, social and cultural life of a city. They can aid in slum clearance and urban renewal, resolve traffic problems, foster industrial development, rejuvenate failing business districts, screen residential areas from manufacturing sections and halt urban sprawl.

If a city's skeleton—its expressways—is ill-shaped, the city can, like a human being, sicken and fail. If poorly located and designed, an urban expressway can blight a thriving business district, back up traffic into residential areas, take valuable real estate from the tax rolls, become a Chinese wall between a shopping center and the neighborhood it serves, and drive citizens into the suburbs.

In cities that benefit the most from urban expressway construction there has been a coordinated approach to highway location and general urban development. State highway departments have worked with various city agencies, planning commissions, traffic bureaus, departments of public works, housing organizations and municipal administrations.

Cooperation of this kind is widespread, according to the results of a recent survey made by ENGINEERING NEWS-RECORD. To study the way the Interstate highway system fits into the cities of the U. S., ENR polled leading highway engineers, city planners, educators, industrialists, economists, and government officials at city, state and federal levels—all of them much concerned with the design and location of urban expressways.

All of the state highway departments replying to the ENR questionnaire report that they work jointly with their cities in setting up an expressway network within the city boundaries. Most have some variety of urban planning division.

Most cities report the organization of committees made up of state highway people and representatives of local agencies to work out Interstate routes. In some cities downtown property owners get together to offer recommendations.

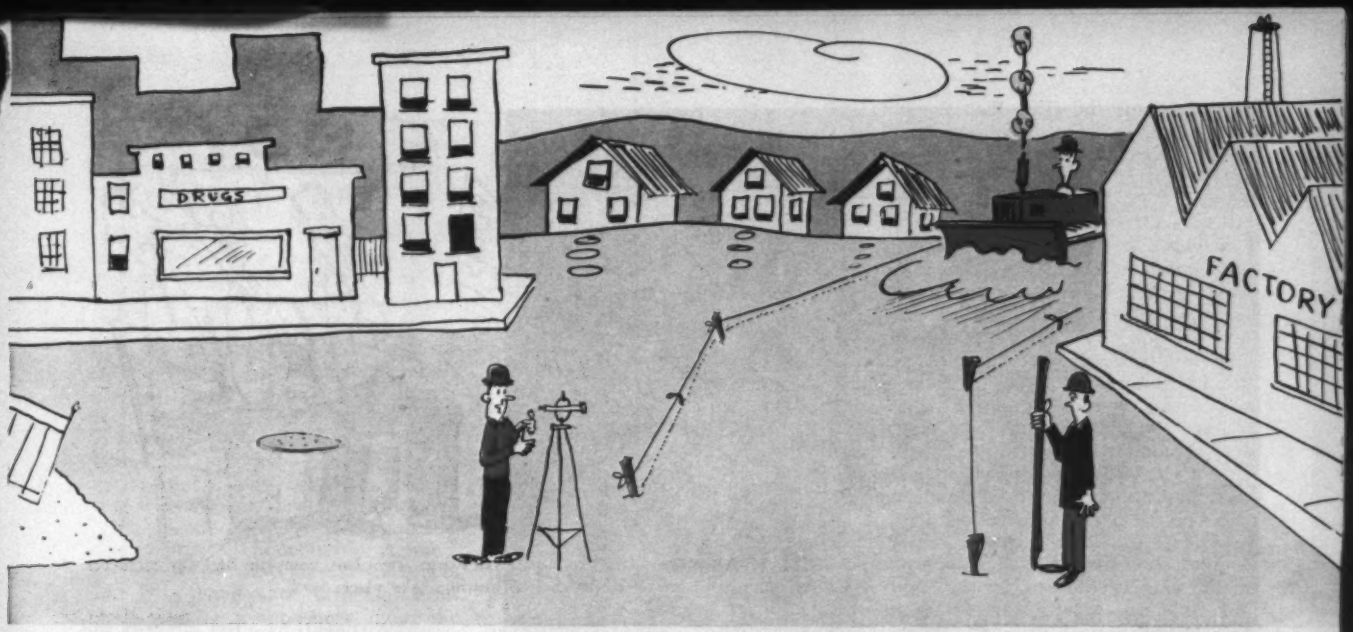
ENR's urban expressways questionnaire asked for suggestions for improving the degree of cooperation between planners and highway engineers.

"Strong central administrative leadership is needed to knock heads together," says the director of an unofficial highway organization. "Also there is need for an officially created technical coordinating group of planners and highway officials representing all jurisdictions and empowered to make a group decision."

Herman L. Danforth, director of Public Works of Tucson, Ariz., answered: "The greatest need is someone on the state highway department staff with a good city planning background who could and would provide effective liaison between the highway planners

HIGHWAY ENGINEERS too often see city planners as dreamers, unwilling to act.

***Associate Editor Joseph F. Wilkinson** wrote this article after months of research and scores of contacts with thinkers on the subject. Then he went to Kansas City to do the companion piece beginning on p. 32.*



EXPRESSWAYS can shield residential areas, aid redevelopment, clean out slums.

Can Make or Break a City

and the local planning administrative offices."

None of the highway departments offered any proposals for increasing the amount of coordination.

ENR's urban expressways questionnaire asked: "Is your city taking the fullest advantage of the opportunities offered by urban expressway construction?"

The state highway departments were unanimous in their belief that the cities in their states were taking the fullest advantage of the opportunities offered by urban expressway construction. The only exceptions were a few highway officials who refused to admit that urban expressways had any function other than to carry traffic.

The dissent came from just about all of the other groups queried.

Only 60% of our cities are exploiting the possibilities presented by Interstate highway building, say the respondents.

Robert B. Pease, executive director of the Urban Redevelopment Authority of Pittsburgh said, "Where possible, express highways are included as a part of urban renewal projects or as boundaries of urban renewal projects. In all events, the renewal planning in Pittsburgh takes into account the City Planning Department's Master Plan of Highway Networks."

Among businessmen, Louisville presents some interesting contrasts. In replying to whether or not Louisville was taking the fullest advantage of the opportunities offered by the Interstate program, Grady Clay, nationally known real estate editor of the Louisville COURIER-JOURNAL, said, "Absolutely not!" But his newspaper's publisher, Mark F. Ethridge, thinks quite the opposite, as does the general manager of the Louisville Chamber of Commerce and the president of one of the city's many distilleries.

Edward Magee, executive director of Pittsburgh's Allegheny Conference on Community Development said, "We are prepared to and we are equipped to (take advantages offered by urban expressway construction), but up till now our local relations with state and federal highway authorities have been most unsatisfactory and unproductive." Interestingly, Mr. Magee's predecessor was Park H. Martin, now Secretary of Highways of the Commonwealth of Pennsylvania. Mr. Martin feels that relations are good and productive.

James E. Fain, editor of the Dayton (Ohio) DAILY NEWS says that in his city: "We are trying. It has been difficult to integrate the expressway projects with urban renewal, because of lack of coordination in Washington. Our city plan division has worked effectively toward this end. We have been considerably handicapped by a failure of the Bureau of Public Roads to give us a decision on a key expressway project."

Planners were split down the middle on this question of expressway use in city plans. The planners who are employed by cities said that their city was doing quite a good job. Those not employed by the city in which they live or work were less enthusiastic.

Carl Feiss, articulate chairman of the American Institute of Architect's National Community Planning Committee answered: "Generally speaking, our cities are not taking advantage of the opportunities offered. On the other hand, however, the AIA does not feel that the highway program should be used as an excuse for slum clearance. It is, of course, desirable that urban expressway construction and urban renewal coincide. But the highway construction program should not be converted into a slum clearance program on the ground that in this manner cheap land for highways can be obtained."

ENR asked recipients of its question-

CITY PLANNERS sometimes see highway engineers as dictators with bulldozers.

naire to name the cities they thought outstanding in the coordination of urban expressway construction with other areas of city improvement. The leading five cities and the way these cities achieved coordination are:

Kansas City—A committee made up of representatives of the Bureau of Public Roads, the Missouri and Kansas highway departments, the City Planning Commission, the county highway engineer, traffic department, the redevelopment authority and other agencies work under the coordination of the city manager on problems involving design and planning of all highways in the area. The city's downtown freeway loop has already shown a stabilizing effect on the central business district.

Chicago—A joint highway design committee, made up of representatives of the City of Chicago, Cook County and the Division of Highways of the Illinois Department of Public Works and Buildings, handles planning and design of expressways in Chicago. A representative of BPR attends all meetings.

Chicago's Department of City Planning, working with the Department of Public Works and other agencies, coordinates planning of urban expressways, slum clearance, urban renewal and other city improvements.

Long-range planning for highways and mass transportation facilities is the function of the Chicago Area Transportation Study. Established in 1955 by the city, county and state in cooperation with BPR, it acts in an advisory capacity to them. It operates as a segment of the Division of Highways.

New Haven—The city planner and the traffic engineer work together to solve highway and transportation problems. With aid of the city administration, they present their views to the state highway department and work with it. Traffic factors that tend to locate some types of highways in the outer edges of the central business district have been coordinated with urban renewal plans for clearance of slums that usually occur in this area. Plans are reviewed in the early stages by area planners of the State Development Commission, which is responsible for encouraging local planning and development of industrial sites.

Detroit—The City Highway Advisory Committee is made up of men from the City Plan Commission, the Traffic Engineering Bureau and the Department of Public Works. The conclusions this group reaches on expressway routes are discussed with the State Highway Department, the Wayne County Road Commission and the Bureau of Public Roads. The highway committee also works closely with the Detroit Housing Commission. The State Highway Department's planning staff includes employees trained in city planning.

PUBLIC HEARINGS attract only critics of expressway plans, complain highway engineers. Critics claim plans are all settled before hearings take place.

San Diego—A Technical Co-ordinating Committee supervises transportation studies. Members of this committee are planners and engineers of the six communities in the area, representatives of the county, the California Division of Highways, the San Diego Transit System, the Traffic Division of the Police Department, the Urban Renewal Co-ordinator, the Industrial Co-ordinator, the U.S. Navy and BPR.

A few years ago cooperation of this degree was rare, because in many cases city planners and highway engineers had only one thing in common, their extreme disdain for each other.

For years many highway engineers thought of the city planner (if they thought of him at all) as a dilletante, a dabbler interfering in serious work, an ivory tower boy, an impractical architect, a man long on ideas and short on action.

Many planners meanwhile denounced the highway engineer in print and from the rostrum as a would-be dictator, a monomaniac intent on driving a 300-ft-wide strip of concrete arrow-straight through the cities, leaving gutted business districts, divided neighborhoods, and ruined historic shrines in his path.

Grotesque as these attitudes appear, they have existed, still survive. And often there is reason.

It's not unusual, even now, for a city to be without a plan, even though it has a city planner. The man can have elaborate models and artist's renderings of what his community will look like in 2060 and nothing in mind for 1965.

Some highway engineers still brush aside advice and criticisms and build urban expressways like rural highways, no matter what the damage.

The importance of this classic battle between highway engineers and planners lies in the fact that the state highway departments have the authority and responsibility to plan, build and maintain the highways financed by the Interstate program, including those that will go into the cities. All Interstate projects, however, must have BPR approval.

The first large scale attempt at settling this feud occurred in 1957, when the Connecticut General Life Insurance Co. of Hartford staged the Hartford Symposium.

The company brought together 700 persons from all over the country, highway engineers, city planners, educators, civic leaders, economists, government officials, architects, traffic engineers, all of them influential men with pronounced interest in the effect of the Interstate program on American cities.

The aim of the three-day symposium was to find out what should be done to assure a better future for our metropolitan regions, and how we should proceed to gain the objectives we seek.

The sponsors of the symposium hoped that if they could get together under one roof the men responsible for the future of the nation's cities, a mutual approach to action would result.

The speakers were men who were involved not only professionally, but emotionally with urban expressways. They had a lot to say, and for many this was the first opportunity to say it to the right people. The unintended immediate result was a lessening of whatever common purpose, mutual respect and potential cooperation that existed before.

"Probably not much good will was created," said transportation economist Wilfred Owen. "It was a shocker to both sides and may have caused resentment. It must have been the first time the two groups got together."

The main profit in the Hartford symposium was that the need for coordinated planning of urban expressways came to the notice of many of the

country's decision makers, lawyers, economists, bankers, business executives and leaders of civic organizations. These men returned to their home towns to press for coordination.

The engineers and the planners got much closer to a coordinated urban highway program a year later at the Sagamore Conference on Highways and Urban Development. This meeting, held at the Sagamore Center of Syracuse University, was much smaller, only 55 men. There were about 10 highway department executives, an equal number of planners, four BPR officials; the rest were representatives of organizations interested in highways, educators, city officials and housing experts.

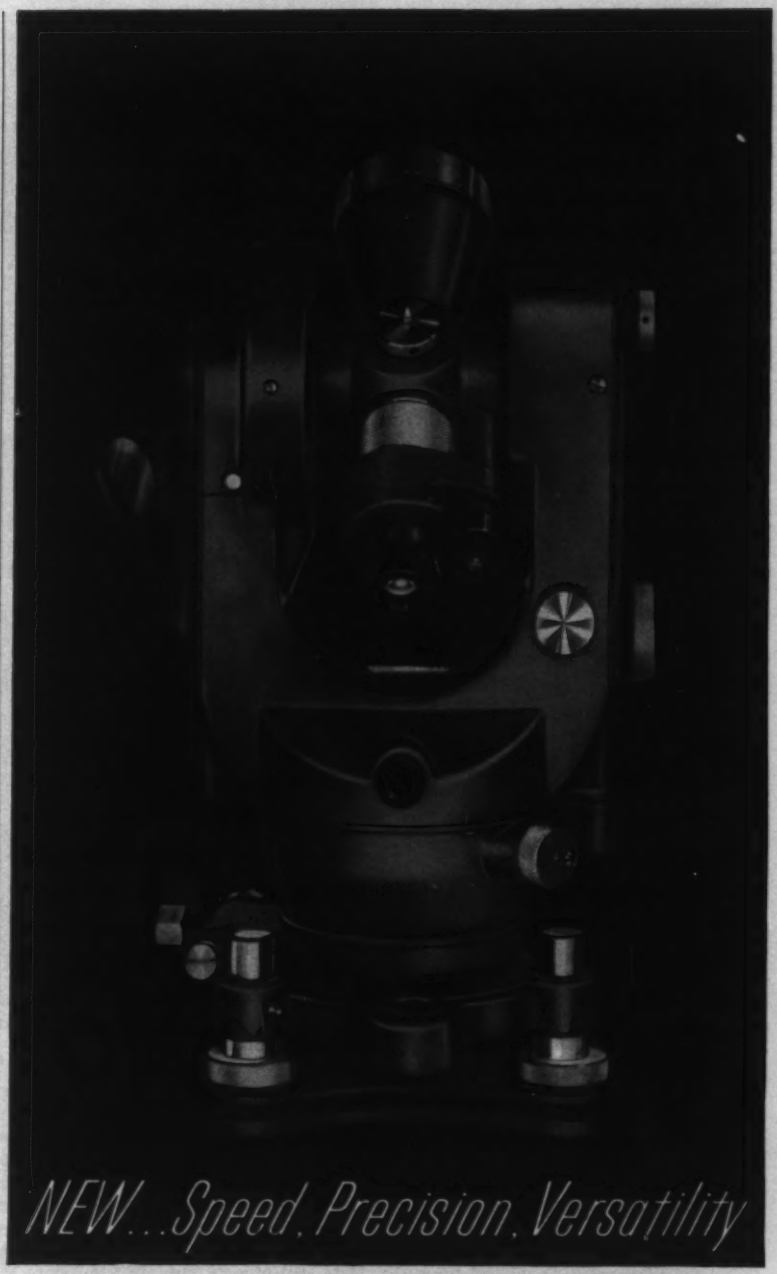
The result of this five-day meeting was a booklet, "Guidelines for Action," that has been well received by all parties and is credited with bringing about closer working relationships among the men responsible for the future of our cities and their expressways. Included in the guidelines are recommendations for state, local and joint operations.

State highway departments are advised to: 1) be organized and staffed to work cooperatively with local authorities in planning urban highways; 2) develop a tentative program of urban highway improvement as a basis for local-level planning; 3) consult with local authorities on a continuing basis, and 4) take responsibility for initiating planning where a community has not yet begun a plan.

Local governments are advised to: 1) have a city plan; 2) have a competent and continuing planning service; 3) initiate regional planning in metropolitan areas; 4) consult regularly with state highway departments in preparation of comprehensive plans for urban areas, and 5) work with state governments to enact legislation permitting proper planning on a local, metropolitan or regional basis, if this legislation is presently lacking.

Jointly, all agencies concerned should: 1) strengthen their support of city and regional planning; 2) seek public support and adequate finances for programs based on comprehensive planning; 3) undertake studies to provide basic facts for transportation and broad community planning, and 4) publicize successful application of techniques and achievements in coordinated urban development.

"Guidelines for Action," has been widely distributed and can be found in the office of almost every highway engineer, BPR man, city planner and housing administration official. Commissioner of Public Roads Ellis Armstrong sent copies of it to BPR's regional and division engineers, advising them that the bureau "strongly endorses the 'Findings and Recommendations' as formulated at the Sagamore Conference. Field



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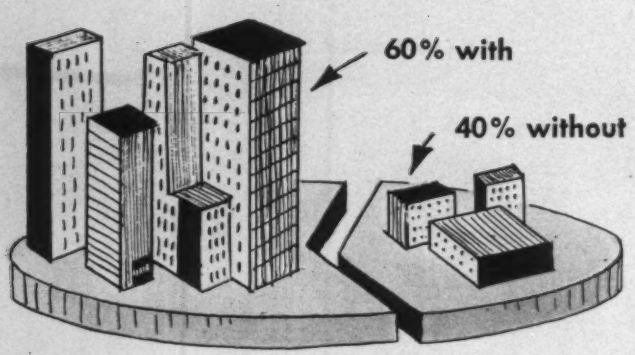


ONLY 60% OF U. S. CITIES are taking full advantage of rebuilding opportunities offered by urban Interstate highway construction, according to ENR's survey.

personnel should take what ever action is possible to encourage implementation of these recommendations by state and local agencies."

The conference's recommendations also have the endorsement of the American Municipal Association, the American Association of State Highway Officials and the American Institute of Planners.

The AIP bulletin recently said, "Following the Sagamore Conference and other undertakings, there have been a number of signs that closer working relationships are being developed."

Despite existing cooperation between many state highway departments and cities in the design and location of urban expressways, critics of the Interstate program claim that cities are legally defenseless in disputes with state highway departments. If the highway engineers want to plough a road through city hall, they've got the right to do so and wouldn't hesitate, either, according to popular legend.

FORTUNE MAGAZINE, for example, wrote of state highway engineers: "They have been accustomed to drive ahead with new ideas, to ride roughshod over local interest, to have their way almost without challenge. Now the highway departments are imposing what amounts to a master plan for development, particularly in urban areas . . . If the record of the past is any criterion, the routes —and the design for the future they impose—are likely to reflect highway department emphasis on traffic service and cost of construction, rather than such considerations as metropolitan vitality and livability."

The Federal Highway Act of 1956 under which the Interstate program is built, offers the cities little defense in arguments with the state highway departments. All it says, in Section 116, is that the departments must hold public hearings or afford the opportunity for such hearings and have considered the economic effects of Interstate highway locations. Nothing in the law says the highway officials have to consult with cities or get their consent when they decide to build an expressway.

Actually, in half of the states the law demands that the highway department must have the approval of a city of its construction plans before it can build highways within the city boundaries. But in the other half of the states, mutual acceptance of an urban expressway routing by a city and the state highway department is usually a matter of policy. But in these states the highway engineers can, if BPR backs them up, override municipal objections to their location and design and build away.

In the case of disagreement over location of an Interstate highway, the cities can appeal to the Bureau of Public Roads. BPR approval is necessary before a state can accept bids on a project.

"Where there is a conflict between a city and a state highway department, the division BPR engineer can hold up or approve the project," says Joseph Barnett, deputy assistant of BPR's office of engineering and an authority on urban expressways. "If the division engineer approves the project and the city still objects, the city can go to the regional engineer. And the city can appeal his decision to the offices here in Washington. We've had a few cases of this happening."

Queried on whether or not the states should be required by law to get the consent of cities for urban expressway work, 13% of the respondents to ENR's questionnaire said 'no.'

Most of the objectors to mandatory city consent to expressway plans say that veto power in the hands of the city would jam up the Interstate program. Many of the replies see such a law as an encroachment on state sovereignty.

In those states where a law demanding consent exists, highway departments find it a good one. A typical reply was from E. S. Preston, director of the Ohio Department of Highways: "Although this requirement may appear to be irksome at times and often is time-consuming in working out mutually satisfactory results, I believe this to be a desirable requirement."

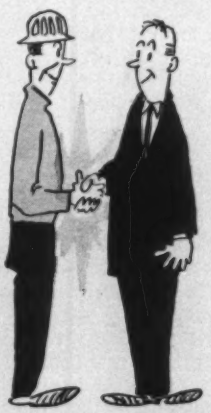
The majority of those consulted by ENR, 85%, think that highway public hearings are well publicized. Only 56% of them believe the hearings have any significance. Eight percent say the hearings are valuable, but only if held prior to final decisions on location and design. The remaining 36% say the hearings mean nothing at all. Many say that the hearing pays lip service to the law and once they are over the highway departments proceed with their original plan.

Some of the highway departments were among the 36% who think little of the value of public hearings. The common complaint by the engineers is that only critics come to public hearings, that citizens who like a highway plan never appear.

"Public hearings too frequently are window dressing in that the hearings are held when the design is so far along that it is too expensive to change if public opinion so dictated," says Lloyd M. Braff, executive director of the Central Business District Association of Dallas. "In many instances there is an attitude of 'here it is whether you like it or not.'"

In most states the rights of the public at hearings are: the right to be heard and the right to learn the facts. Most states give citizens the right to appeal in courts, but few citizens can afford this.

Highway departments with a strong public relations sense no longer rely on public hearings to make their case for expressway location. Working with the cities, they explain their projects at series of neighborhood meetings. The usual result is stronger public support.



COOPERATION PAYS OFF—Read how one city uses expressways well; see p. 32.

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Kansas City's freeway loop supports redevelopment projects in the business district.

Construction projects will give a new look to Kansas City

1. Northside Redevelopment
2. Eastside Renewal
3. South Humboldt Redevelopment
4. Attucks Redevelopment
5. T. B. Watkins Public Housing
6. Wayne Miner Public Housing
7. Choteau Court Public Housing
8. Quinotte Manor Public Housing
9. New Public Library
10. Traders Bank Building
11. Commerce Trust Co. Building
12. Quality Hill Towers Development
13. North Paseo Neighborhood Renewal
14. Proposed Federal Office Building

Kansas City

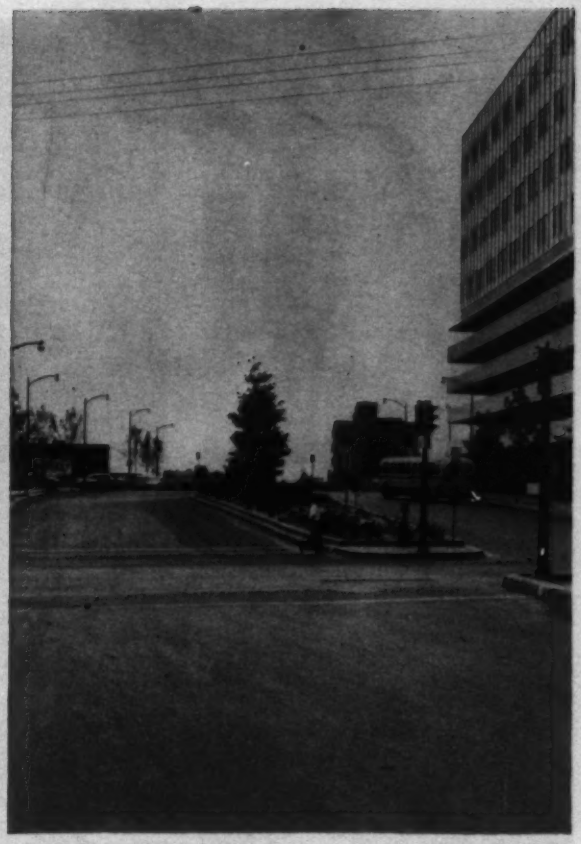
Kansas City, Mo., is one of the country's outstanding examples of intelligent integration of urban expressways into an over-all city development program.

The city's expressway network was developed as part of a master plan for general improvement, not included as an afterthought because of the passage of Interstate Highway legislation. As a result, the expressways not only carry traffic, but give definite support to urban renewal, public housing programs, slum clearance and industrial development.

The focal point of Kansas City's $300-million expressway system is the downtown freeway loop, which completely surrounds the 425-acre central business district. The loop will act as a hub for major Interstate highways entering the city from surrounding urban and suburban areas.

The freeway loop, which forms a rectangle 1½ miles long and one mile wide, was planned as a ring road to tie the central business district to the suburbs, giving shoppers and workers rapid access to it. Through traffic,

BEFORE the freeway loop, Main St. was a slum.



AFTER the loop, a redevelopment cleaned it up.

Thrives on Its Expressways

which has congested the business district in the past, will be able to bypass the area. The entire system is designed for anticipated 1970 traffic.

The loop will function as more than a relief from traffic congestion; it is acting already as a frame for extensive renewal and development in the area it will enclose.

The $90-million loop is only about one-third completed. The first leg, the north side of the rectangle, is the six-lane Intercity Freeway, which was opened to traffic in 1957. The east side of the loop, a section of the Southeast Expressway, is under construction. Work will start soon on the south leg, the eight-lane Crosstown Freeway. Design of the fourth side, the West Freeway, is almost finished.

Like most cities in the United States, Kansas City developed in a series of widening circles. It began in 1821 as a fur-trading post on the bank of the Missouri River, and was incorporated in 1853. It has grown, through annexations, to the point where its 316-sq-mile expanse makes it the fourth largest city in the U. S., in point of area.

Because of this steady growth, the downtown area was surrounded by a ring of residences that years ago had been the homes of the wealthy, but had been deserted by them and degenerated into slums. Some of these houses dated back to the 1850's. The result was a skid row notorious throughout the country.

The planners of the freeway loop wanted a system that would handle traffic, but also one that would define the business district and wipe out thousands of decayed houses.

According to the Missouri State Highway Department, construction of expressways in Kansas City took out 11,000 dwelling units, most of them in blighted neighborhoods.

"The project was a natural all the way," says Jack Falin, director of the city's Department of Traffic. "In looking for routes, they wanted the least expensive ones and naturally they hit on the blighted areas. Also, the city tax rolls don't suffer, because these slum sections weren't high-tax areas."

The north side of the loop, the Intercity Freeway, wiped out the greatest number of slum dwellings of any of the expressways. The Midtown Freeway, on the east side, eliminated 1,000 blighted residential units.

The effect of the loop on development of the central business district has been impressive. Businesses and real estate men see the freeway loop as a guarantee of the soundness of the area. As the Southeast Freeway came down the east side of the district, land values within it, particularly on the east side, jumped up.

When the loop was originally proposed, many feared it would become a Chinese wall that would seal off the business and shopping area from the rest of the city. Howard, Needles, Tammen & Bergendoff, the Kansas City consulting engineers responsible for most of the expressways' design, recommended building the loop as depressed highways with most of the streets that lead into the district crossing over them. The freeway loop will be an attractive boundary around the central business district, a combination of green belt and graceful roadways and interchanges that will separate the loop area, but not hide it.

Businessmen and employees now at-

R. N. BERGENDOFF, HNT&B partner, has directed most of expressway design.

A. J. HARMON directs work of the Land Clearance for Redevelopment Authority.

JERRY MANNING is chief planning engineer of City Planning Commission.

tach a fair degree of prestige to being in the loop. Consequently, the quality of businesses in the loop is improving. Adequate buildings are refurbished and old, shabby buildings are giving way to new construction.

Much of the demolition and subsequent replacement by new construction is the result of the work of the city's Land Clearance for Redevelopment Authority. The authority has three projects under way within the loop and all are involved with freeways. A fourth is in progress outside the loop adjacent to the site of the future Crosstown Freeway, where it leaves the loop and runs eastward.

The Northside redevelopment project, which exploits the advantages of the traffic from the Intercity Freeway, cleared out some of the worst blight in the downtown district and led to a cleanup of the entire north side. Flophouses, hock shops and taverns on the site have given way to a $1.3-million motel, a $5.3-million, 12-story office building with parking facilities for 550 cars, and there are plans under consideration for a 13-story apartment building.

In the northeast corner of the loop the authority's Eastside project will eliminate some fringe area slums and return the cleared land to new commercial and residential uses appropriate to the master plan for the city. The Eastside project is bordered on the north and on the east by legs of the freeway loop. These will serve to shield this upgraded residential and commercial area from a planned light industrial area to the east.

Immediately south of the Eastside project is the South Humboldt project. This 27½-acre area, adjacent to the civic center, was a mixture of flophouses, low-grade commercial establishments and antiquated dwellings. It is being developed for commercial use by nationally known companies and for government buildings. A $40-million federal office building will go up on a two-block site here. The freeway loop serves as a boundary for two sides of this project.

Quality Hill, on the western edge of the central business district, was once the home of most of Kansas City's meatpacking kings, cattle barons and banking lords. But they moved out long ago and their mansions deteriorated into grubby tenements. Most of these have been torn down to make way for $26-million worth of construction—middle- and upper-income apartment buildings for the most part. Quality Hill is a private project developed by Lewis Kitchen.

The four projects within the freeway loop have sparked construction in the areas around them. The Commerce Trust Co. will build a 30-story, $10-million office building across the street from the Northside project. A 20-story, $4.5-million Traders Bank Building will go up near the Eastside and the South Humboldt projects.

The new construction within the loop, exclusive of expressway work, is worth about $100 million, the result of the rejuvenation of the area through urban renewal and expressway projects.

Outside of the central business district most of the urban renewal and the seven low-rent public housing projects are located adjacent to the expressways that radiate from the downtown freeway loop. The construction of these expressways removed a lot of blighted neighborhoods. The sight of this slum clearance encouraged conservation programs among property owners near the routes.

Kansas City's vigorous renewal program began during World War II, when there was no money to finance expressways or urban renewal, just an idea that there would be some day.

L. P. Cookingham, city manager of Kansas City from 1940 to 1959, is credited with initiating and pushing through the city's long-range, all-inclusive master plan.

"Cookingham could bang heads together nicely," says Charles Curran, of Community Studies, Inc., a local research group. "He could also sell these plans to the city council, the public and business interests.

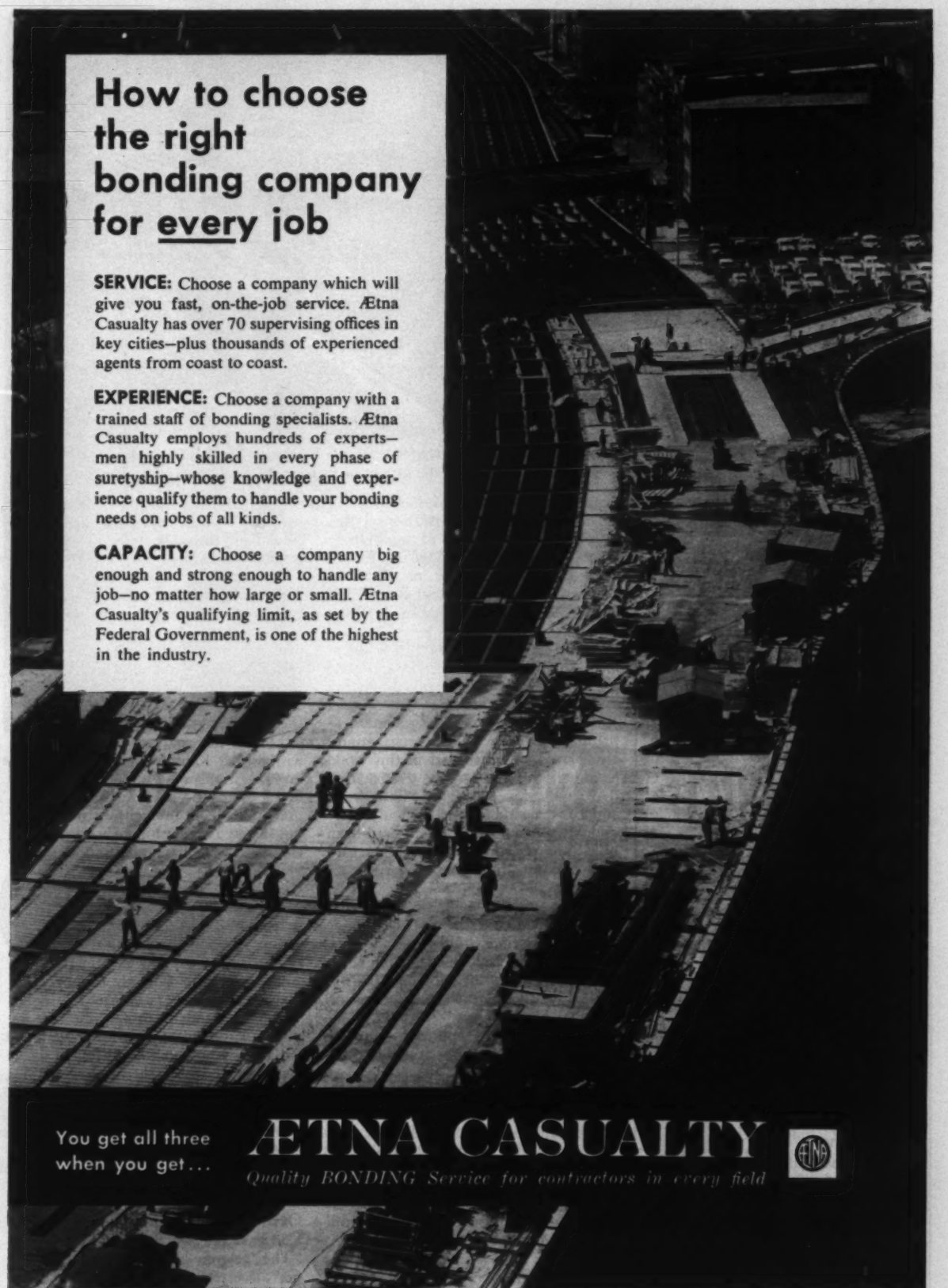
"He was more than just an administrator, he was a father, a guide, a politician, a public relations expert. His plans had no precedent; he had no examples to point to. But he was able to get people excited, to sell them a scheme like this one on his personality alone."

A cooperative group, the Greater Kansas City Interregional Highway Committee, was formed in 1943 to review and coordinate expressway studies. Mr. Cookingham was its chairman. It was composed of representatives from Kansas City, Mo., and Kansas City, Kan., the two states' highway departments, the Bureau of Public Roads and the five counties that make up the metropolitan area. A special staff of the City Planning Commission that worked with state highway engineers coordinated the expressway program with other programs in the master plan.

The result was a 1½-in.-thick report called "Expressways Greater Kansas City," prepared by the City Plan Commission for the Missouri State Highway Department and BPR.

Because of this early planning, Kansas City was one of the first cities to use Interstate highway program money. It had the right-of-way lines and the general design. All it had to do was adapt the plan to newer conditions.

The degree of cooperation that existed in the early days of planning for expressways, urban renewal and redevelopment was maintained consistently. The outstanding distributors to the coordinated approach were Mr.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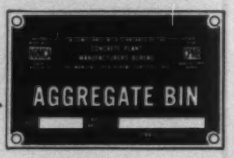

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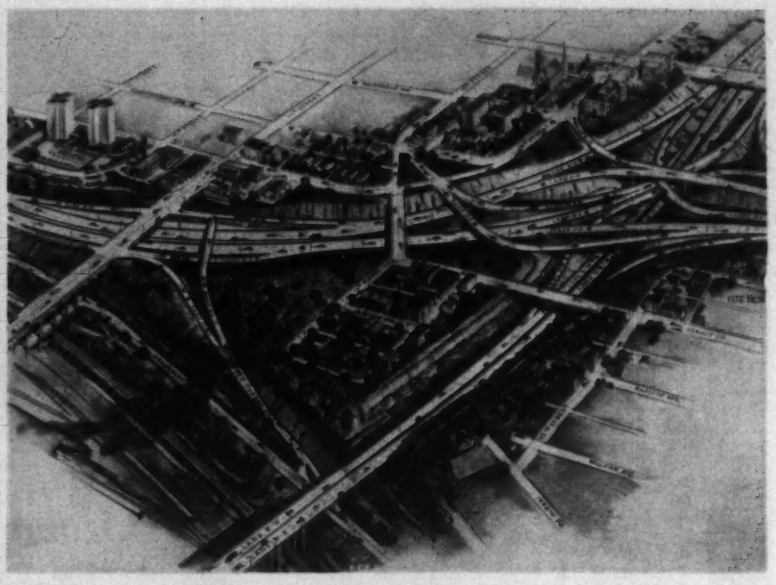


QUALITY HILL INTERCHANGE at the southwest corner of the downtown freeway loop will have four levels, the highest of them at the level of existing streets.

Cookingham; A. J. Harmon, director of the Redevelopment Authority; Rex Whitton, chief engineer of the highway department; Philip E. Geissal, former chief planning engineer of the City Planning Commission, and R. N. Bergendoff, a partner in Howard, Needles, Tammen & Bergendoff.

Kansas City departments, such as Traffic, Water, Welfare, Parks, Public Works, Police and Fire worked together and with the Planning Commission and the State Highway Department in planning expressways. Citizens groups also played an active part in this work.

"There has been good cooperation here, not only among the city, state and BPR, but between the two cities," said Mr. Bergendoff. "There have been practically no controversies with regard to location; things have worked out smoothly.

"Some of the committee hearings would be held here (the HNT&B office) with presentations from representatives of all groups concerned. Comments would be covered at subsequent meetings. We try to reach conclusions on an open-minded basis."

The coordinated approach to problems is still as strong as it used to be. For instance, recently the Redevelopment Authority found that plans for the downtown freeway loop called for an overpass over the south leg that would bring traffic through an area the authority had planned as an unbroken, two-block unit. Meetings with the highway department representatives resulted in a revision of plan to permit the city to keep the two-block unit.

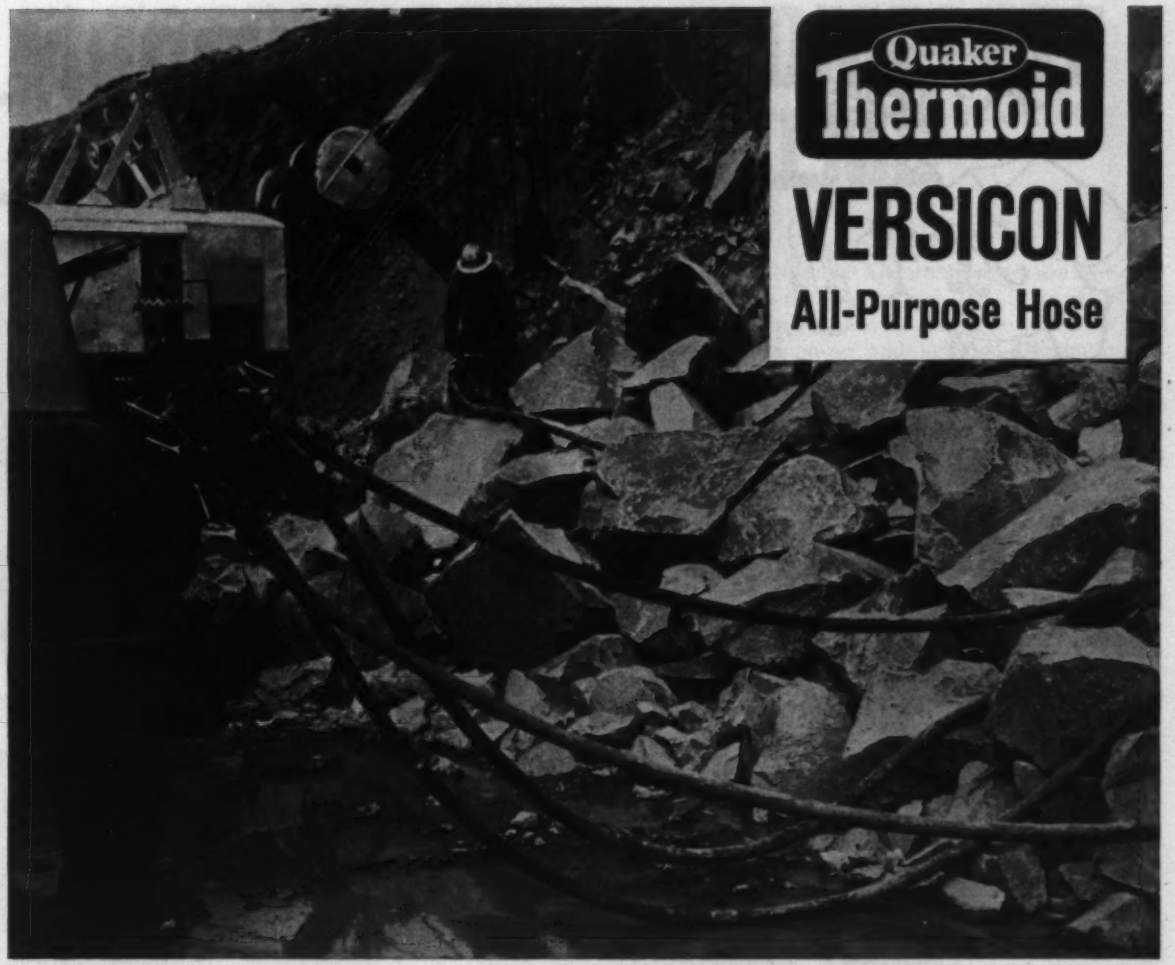
Recently there were divided opinions on whether the overpasses on the south leg should have open slopes or walled-up sections beneath them. The city manager and the state highway department called in the agencies concerned and the matter was ironed out to general satisfaction.

The redevelopment authority and the highway department buy and sell property from each other to take the rough edges off the expressway right-of-way where it abuts on redevelopment projects. No law demands this. In fact, there are those who wonder if it's entirely legal. But the result is good for the appearance of the city.

For all the aggressiveness and vigor with which Kansas City is working to improve itself, some responsible persons there wonder if the city isn't running pretty much on momentum now, lacking inspired leadership to work for further gains. A change of control in the City Council after an election last year resulted in a heavy turnover among heads of city departments. Perry Cookingham resigned to become city manager of Fort Worth. His chief assistant, Robert Tinstman, is now city manager of Abilene. Philip Giessal, former chief planning engineer, went to Louisville. Matt S. Madden, former director of public works, went into retirement.

"Things are coming to a bit of a standstill, because the leaders of the program are gone," said a businessman active in local affairs. "Also, there's a severe tightening of the city's purse strings and the old coordination and continuity are lacking."

People in Kansas City take pleasure in quoting the first line of a song from Oklahoma: "Everything's up to date in Kansas City." But the following line is: "They've gone about as fur as they can go." Everything is up to date in Kansas City. It remains to be seen if they will go any farther.



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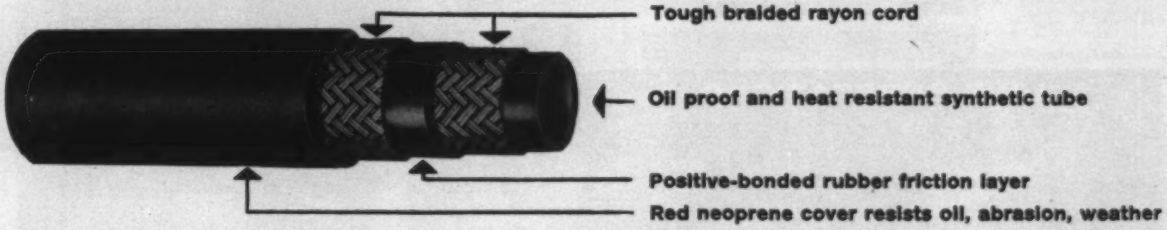
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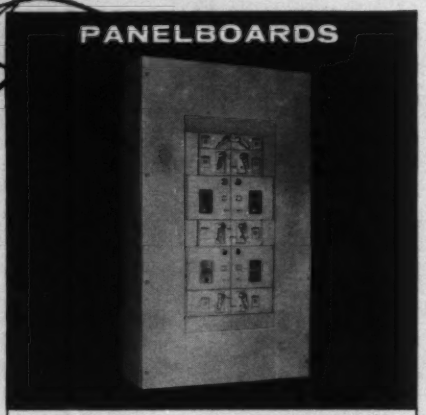

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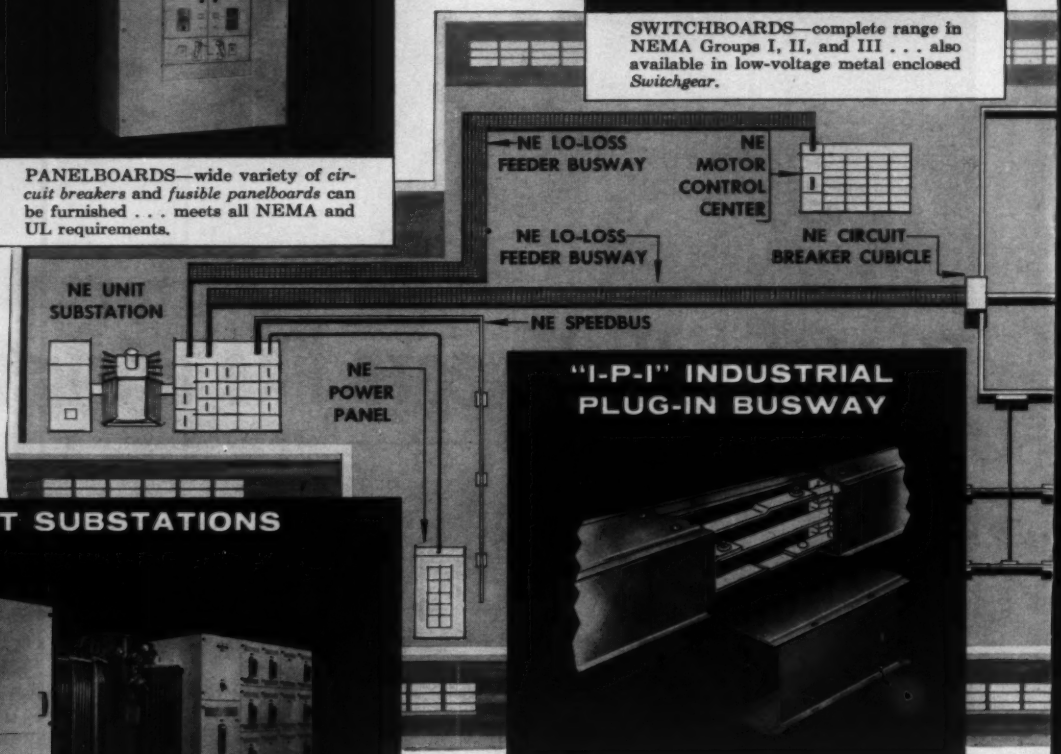

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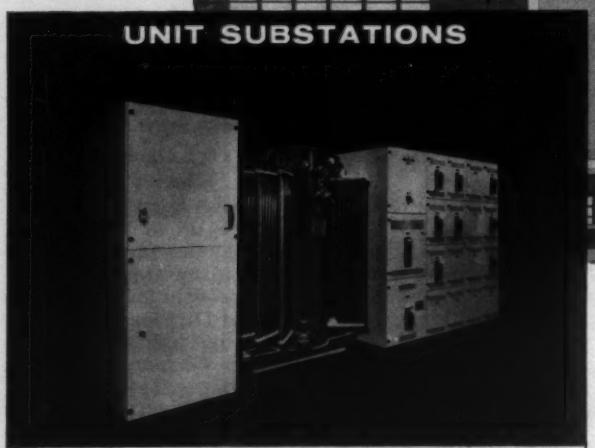

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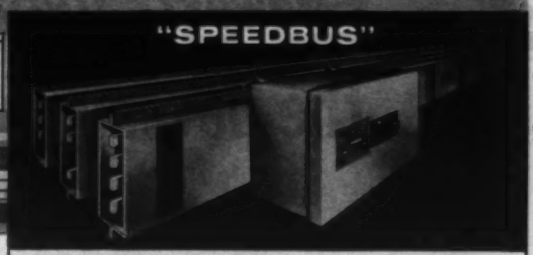

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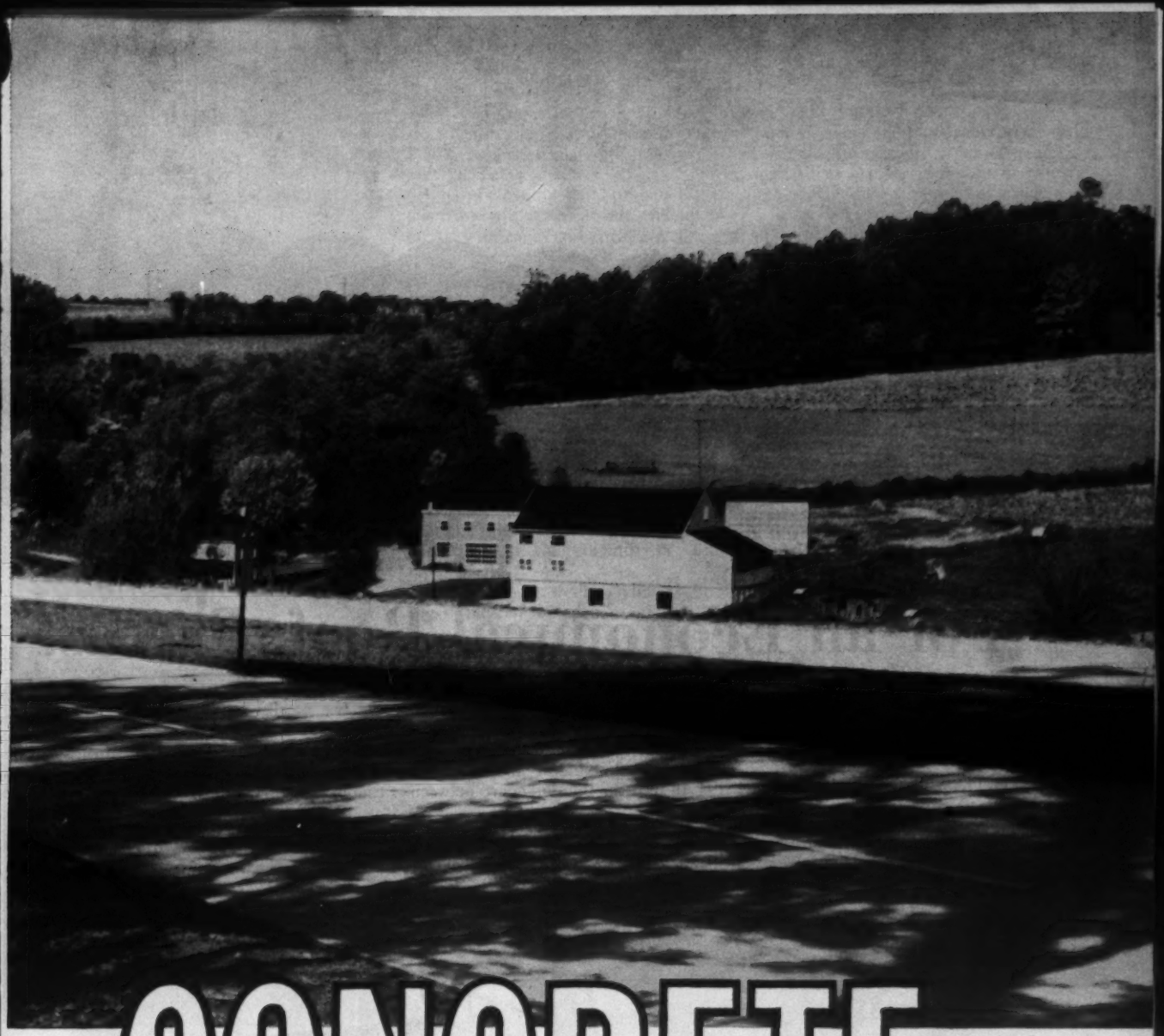

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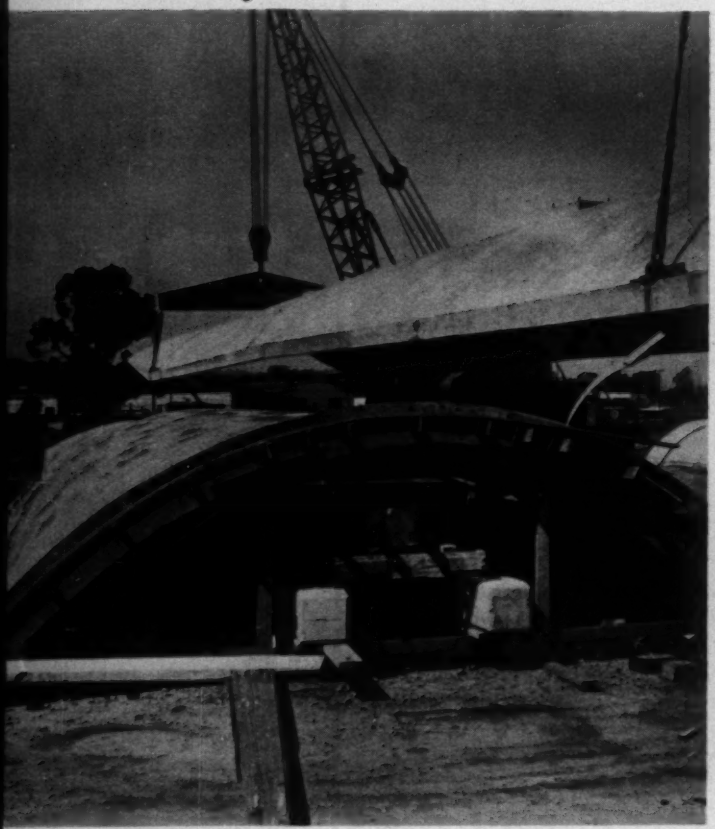
PORTLAND CEMENT ASSOCIATION *A national organization to improve and extend the uses of concrete*

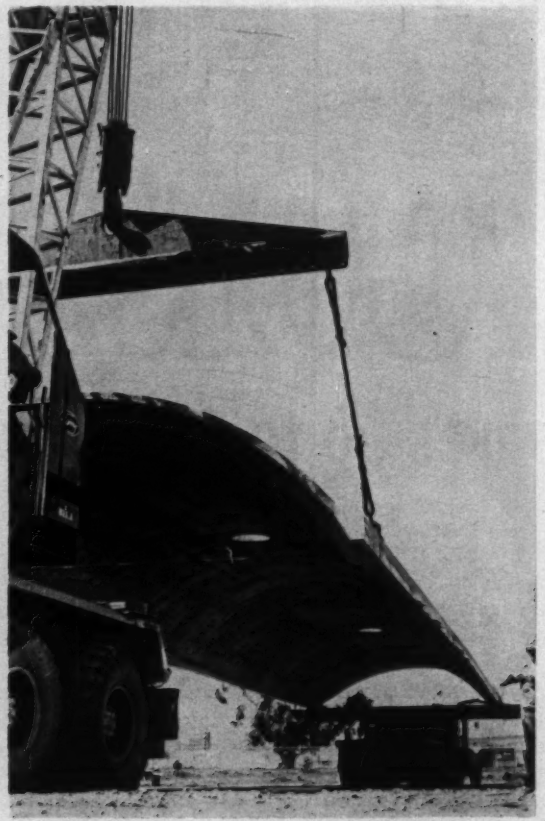
For an Economical Roof: Precast

Precast barrel arch shells form the roof of a pair of new buildings for the San Mateo County (Calif.) Fair and Fiesta.

The buildings are 200 ft long, 81 ft wide. Each barrel is 98½x18 ft and weighs 40 tons, although of lightweight concrete. The barrels span the 81-ft width of each building and cantilever 14½ ft into an interior court between the two parallel buildings. The shells, in general, have a 10-ft radius. However, the overhang radius is gradually increased to 15½ ft to produce a flatter canopy. The $351,200 project includes



SHELLS ARE LIFTED from forms by truck cranes . . .



PULLED to storage on a dolly by a crawler crane

Barrels

22 of the precast units—11 for each building.

Although architecturally striking, the main justification for the shells is economy. Casting the units at ground level was cheaper than casting them in place. The designers estimate erection cost at only 26 cents per sq ft.

The two exhibit buildings are 170 ft apart and are joined at one end by an arcade with toilet and kitchen facilities. Thus, the entire project is U shaped.

The connecting arcade is framed with precast concrete tee members forming a single line of columns and beams at the front and rear of the section. Lighter members run from line to line and carry the roof.

The shells are designed for four-point support on the building's columns, spaced 18 ft c-c. At the front of the building, walls and columns were precast together; in the rear, columns were cast in place and given extra depth to resist lateral forces. The shells are connected to the columns by 4-in. pipe dowels.

The thickness of the shells is generally 3½ in., but the edges are thicker for additional stiffness. Extra thickness also is provided at support points.

Transverse reinforcing consists of two layers of steel bars 10 in. c-c—No. 4 bars at the top and No. 2 bars at the bottom. Longitudinal reinforcing is a single layer of steel varying from No. 3 bars 9 in. c-c to No. 6 bars 3½ in. c-c. There is some additional reinforcing in the haunch over support points, and diagonal bars are provided near the supports for additional shear resistance.

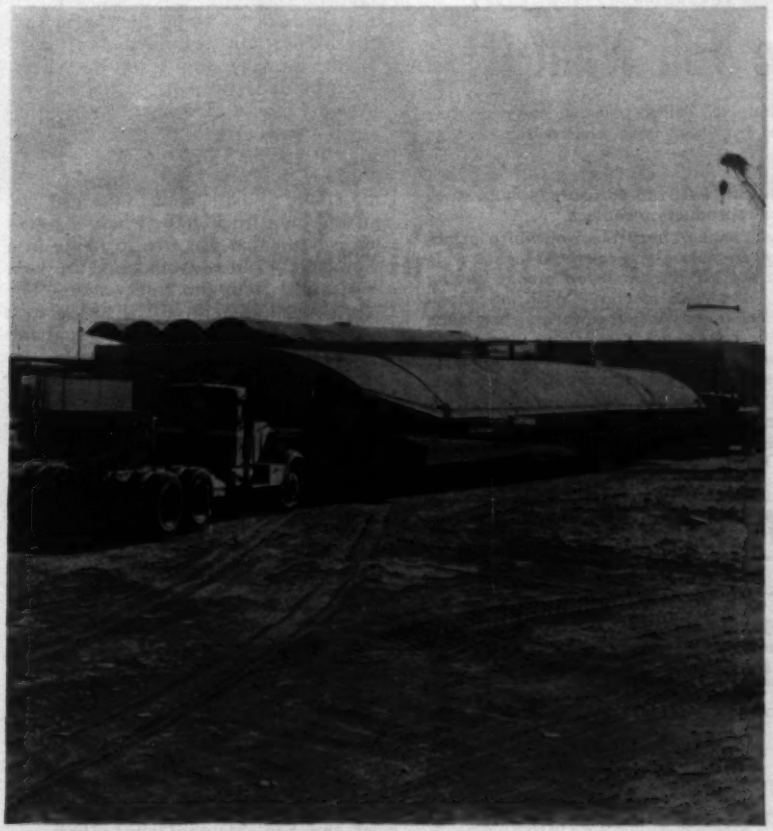
Space between the top of the walls and the shells is glazed with a clear plastic mounted in an aluminum framework to let some daylight into the building interior. It does not bear against the precast units to interfere with shell action.

When erected, a 1-in. longitudinal gap between shells is filled by a sheet metal gutter and later covered with roofing material.

In fabricating the shells, the contractor found that four sets of forms would provide the most economical operation, considering cost of forms and cost of stripping. With four forms, cranes would have to be brought on the job six times to remove the shells from the forms. Had two forms been used there would have been eleven on-and-off changes for the cranes. And with six forms, such changes would have only been reduced by a ratio of six to four.

The forms were plywood. They were supported by 2x4 joists resting on wood trusses spaced about 4 ft c-c.

One of the important aspects of form design was to make sure that the forms



TRANSPORTED to building by trucks and dollies at each end and . . .

ERECTED by two truck cranes.

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stayed in place as the huge precast units were lifted. A concrete foundation was cast along each edge of the form and a piece of 2-in. lumber was bolted to the foundation. The plywood forms then were nailed to the wood stringer and concrete weights were hung on the underside of the forms.

After the shells were cast, a seven-day curing period was necessary before they could be stripped from the forms. It took another three or four days to get the forms in shape and place the necessary steel for another pour. Thus, the casting work was on a 14-day cycle.

Concrete design called for 105 pcf lightweight-aggregate concrete made with a 7½-sack mix that would produce a 28-day strength of 3,750 psi. Control of water content for this lightweight concrete was especially critical. If the mix was too dry, it was almost impossible to get the concrete out of the truck mixers.

On the other hand, if too much water was used, slump would be greater than the 3-in. requirement, and it would be nearly impossible to hold the mix in the sloping forms.

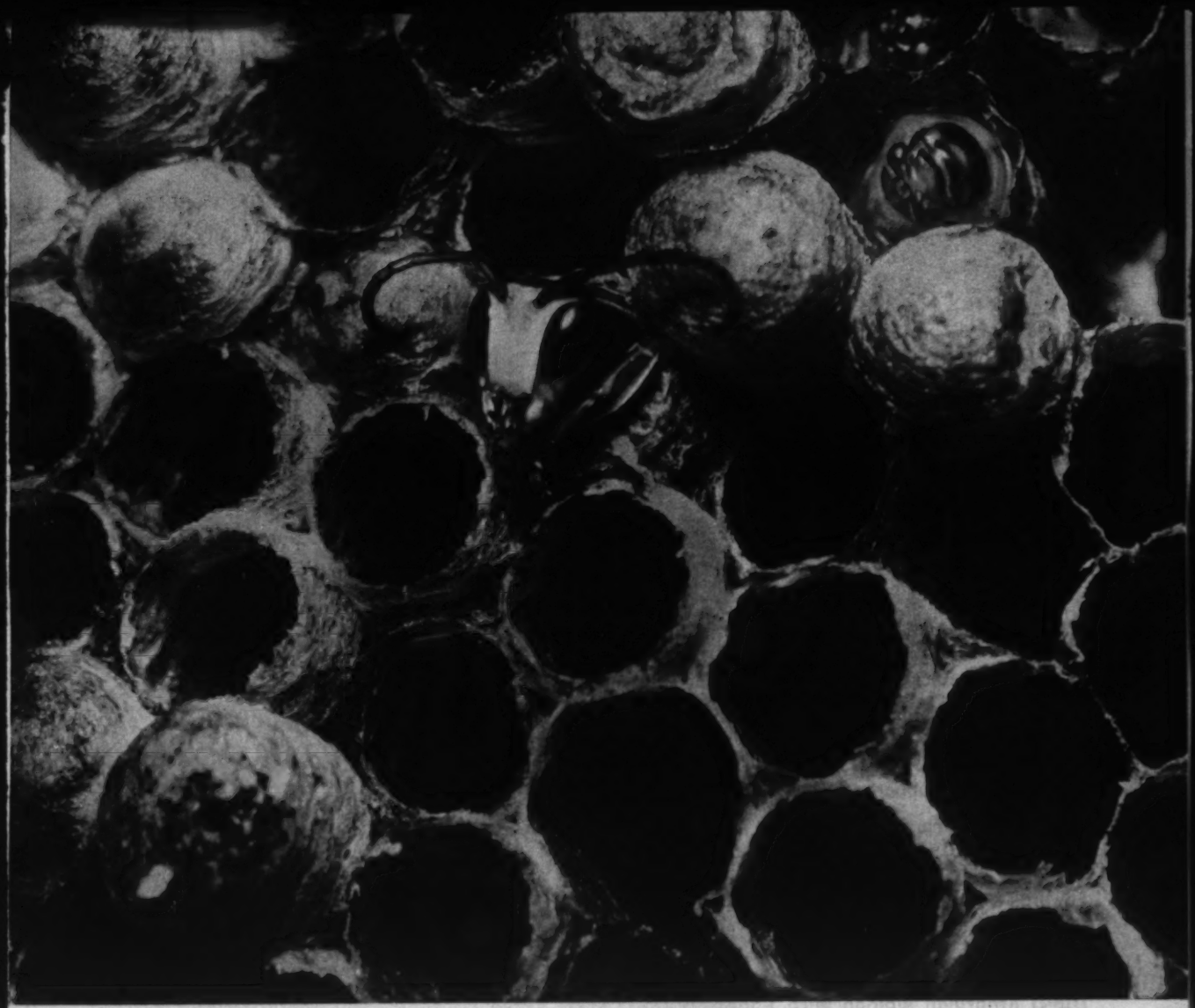
The most critical phase of the construction operation, however, was handling the heavy shells—lifting them from the forms, moving them to the site and erecting them. A pair of truck cranes was used for removing the shells from the forms, with lifting cables attached at the support points on the shells. Steel tie bars ⅞ in. in diameter were installed at the support points to keep the shells from spreading and then removed after the shells were erected.

Each shell was lifted from the form by cranes at both ends. One end was placed on a truck dolly, where it rested on a beam that was free to rotate in a horizontal plane; the other end was kept suspended from the truck crane. The shell was moved in this manner to a storage area close to the casting yard and about 500 ft from the building site.

Movement of the shells from the storage area to the building was done by a pair of tractors and dollies. Erection was accomplished by two truck cranes, which walked the shells down the building to proper position. A 50-ton crane was used to raise the cantilever end of the shell and a 35-ton crane, the opposite end.

At the end of each building, a concrete gutter was cast in place along the outside edge of the last barrel, tied to the top of the end wall and extended out to merge with the cantilever.

Architects for the project are Janssen, Daseking & Keller of Menlo Park. Structural engineer is Isadore Thompson of San Francisco. Contractor is W. A. Moroney, Inc., Burlingame, Calif. William M. Wilson is manager of the San Mateo County Fair and Fiesta.



Meet an expert in light construction A hornet nest is one of the few geometric structures built by nonhumans. Hornets chew wood fibers to a pulp, then build their nest entirely of this home-made paper. Notice the design of these cells; they're hexagonal for space economy. This hornet nest is light, yet strong enough to protect against the elements. ☐ To achieve these same features in light man-made structures, we suggest USS AmBridge Steel Joists—both standard and longspan. They provide strong, lightweight and economical construction suitable for most any type of roof, ceiling or floor. AmBridge Joists have an underslung, open-web design for maximum headroom, and to accommodate pipe, ducts and conduit in all directions. AmBridge Steel Joists are easy to install. And once in place, they make a safe working platform. Want more information? Write to our Pittsburgh Office for your free copy of a 40-page catalog.

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American Bridge Division of United States Steel

USS

This mark tells you a product is made of modern, dependable Steel.

Another New York skyscraper has been reinforced with USS American Welded Wire Fabric. This is Rockefeller Center's new forty-eight-story Time & Life Building, an outstanding example of contemporary architectural design. The exterior steel columns are encased in stone-faced concrete which project from the walls and serve to accent the vertical sweep of the tower.

The frame supports short span, lightweight concrete slabs reinforced with USS American Welded Wire Fabric. Each slab is 8'0" long and 4" thick. When asked why the fabric-reinforced short-span design was selected for this structure, W. B. Scofield, partner in the structural engineering firm of Edwards & Hjorth, said "This system provides first-class, fireproof construction with a long record of satisfactory service in addition to its proven economy, speed of construction, and occupancy flexibility."

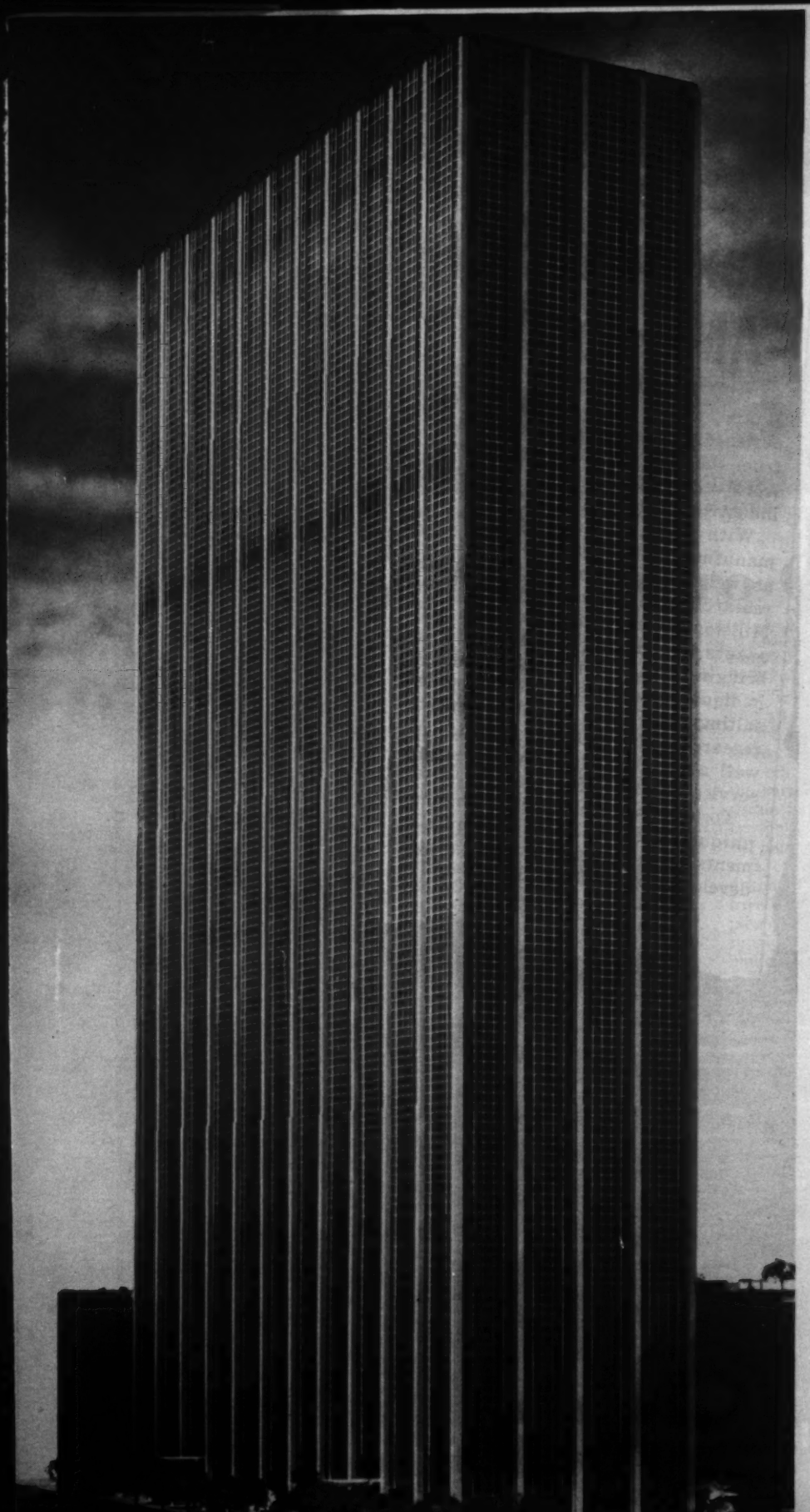
USS American Welded Wire Fabric was also used to reinforce the concrete fireproofing encasement of the columns, girders, and beams. Fabric is excellent for this application because the small, closely spaced members reinforced this thin concrete best. In addition, fabric is easily shaped to fit the contours and is sufficiently rigid to maintain the required shape.

Please write American Steel & Wire, Dept. 0363, 614 Superior Avenue, N.W., Cleveland, Ohio or contact our nearest sales office for complete information on these or any other uses of USS American Welded Wire Fabric.

USS and American are registered trademarks

Short-span fabric-reinforced floor system in Rockefeller Center's Time & Life Building. American Welded Wire Fabric was furnished in long rolls and merely unrolled perpendicular to the beams and on top of the forms. It was draped from the top of the slab over the beams to the bottom of the slab at mid-span. Thus, the reinforcement is in position to best resist both positive and negative moments. The economy of steel placement is apparent. In total, over six million square feet of short-span slabs reinforced with Welded Wire Fabric have been used in New York's Rockefeller Center.

Owners: Rockefeller Center, Inc. and Time Inc.
Architects: Harrison & Abramovitz & Harris
Structural Engineers: Edwards & Hjorth
General Contractor: George A. Fuller Company
John Lowry, Inc.
Fabric Distributor: Fireproof Products, Inc.



American Steel & Wire
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United States Steel Export Company,
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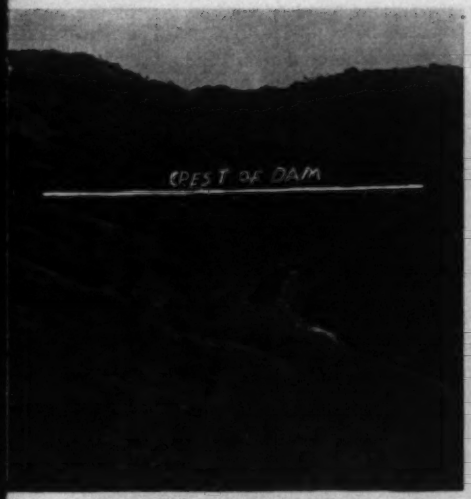
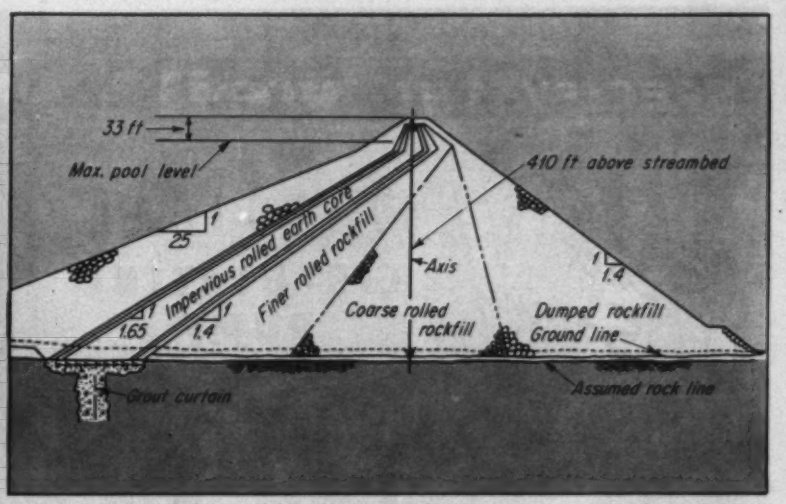


ANGAT RIVER DAM will plug broad valley 25 miles northeast of Manila.



ROCKFILL EMBANKMENT is 410 ft high and has impervious rolled earth core, dumped rockfill on both faces.

Philippines Boost Hydro Output

Construction will start shortly on the Angat River hydroelectric power project on Luzon Island in the Philippines. The National Power Corporation of the Republic of the Philippines (NPC) is building the $64.5-million multi-purpose project. Power capacity will be 146,000 kw. The hydro scheme will also provide domestic and irrigation water, flood control and river regulation.

The project is located on the Angat River about 25 miles northeast of Manila in the foothills of the Sierra Madre Mountains. Highlights of the project are an earth and rockfill dam, a chute spillway, two diversion tunnels, a main powerhouse, an auxiliary powerhouse, a 4,600-ft-long power tunnel, and a 59-ft-dia surge chamber. Several saddle dikes will also be required.

The main dam will be 410 ft high with a crest length of 1,725 ft, and contain about 6.3 million cubic yards of fill material. The 21-mile-long reservoir behind the dam will provide 625,000 acre-ft of usable storage with a drawdown of 177 ft. This storage will provide nearly complete regulation of the Angat River's average flow of 2,700 cfs.

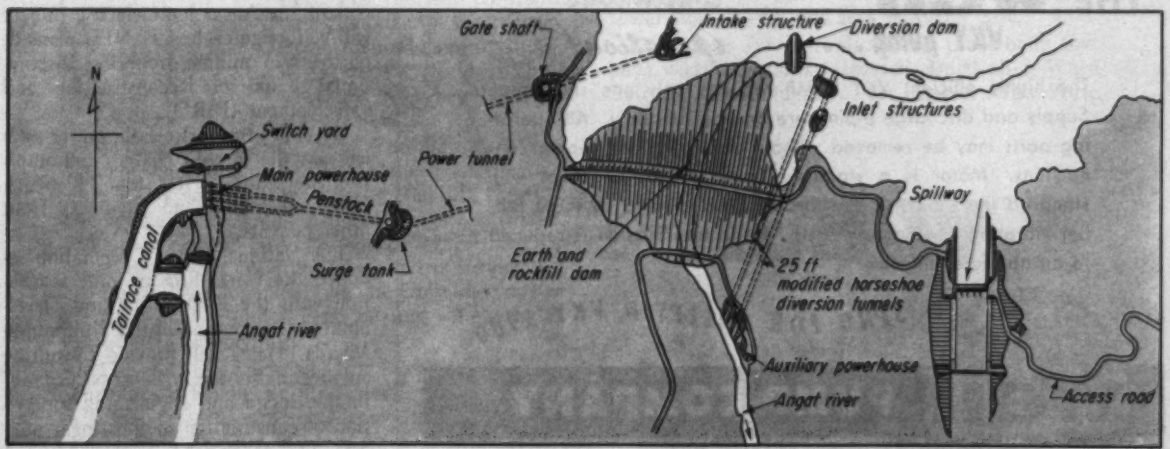
The chute spillway, located in a saddle 1,300 ft beyond the left abutment of the main dam, will have five 39-ft-wide by 41-ft-high tainter gates. The spillway will pass, with surcharge, the design flood of 300,000 cfs from the drainage area of 220 square miles.

Energy dissipation will be accomplished by a "ski-jump" bucket deflecting the jet to the existing river channel, according to Harza Engineering Co., Chicago, joint-consultants on the project.

Two power plants will have a total installed generating capacity of 146,000 kw. The main powerhouse will contain four 34,000-kw units and work under a maximum gross head of 480 ft.

One of the 25-ft-dia, concrete-lined diversion tunnels will be plugged while the other will be converted to serve the auxiliary powerhouse just downstream from the main dam. The auxiliary power house will contain two initial units and space for one future unit, each of 5,000-kw rated capacity. The discharge from this powerhouse and from a bypass valve will, in part, serve present and future downstream water supply requirements for the Manila metropolitan area, with diversion at Ipo.

The Angat River falls nearly 100 ft in making a large 7.5-mile loop downstream from the main dam and doubles back to within a mile of the dam. The



PLAN VIEW presents detached layout of development built on large meander in river with power tunnel cutting across neck of loop. One diversion tunnel will serve as power tunnel for an auxiliary powerhouse just downstream of the dam.

SPECIFY THE weil

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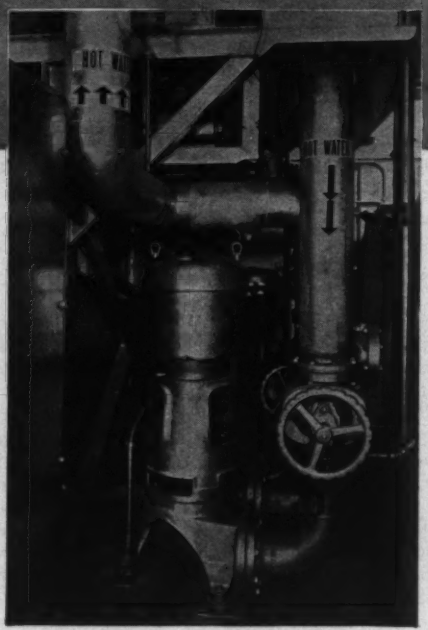

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The highly efficient VKY PUMP requires only one shaft seal. Supply and discharge piping are on one side only. All operating parts may be removed without disturbing any piping connections. Motor is a standard frame NEMA C mount with standard shaft extension. Vibration is eliminated by three rubber vibration eliminator mounts. Noise transmission is reduced to an absolute minimum.

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Ipo water supply diversion dam of the National Waterworks and Sewerage Authority is located about midway on this bend. The 23-ft-dia power tunnel from the reservoir intake crosses the neck of the loop to serve the project's main powerhouse.

The Angat project will permit the two-crop irrigation of 80,000 acres of fertile land on the Luzon plain downstream where only one rainy season crop is now dependable. Substantial flood-control benefits will also accrue in the same heavily populated area.

The project will offer a dependable source of water supply to the Manila area with its present population of about 2.5 million. Critical water shortages occur during the annual dry season.

NPC was constituted in 1937 to have primary responsibility for power development in the Philippines, especially hydroelectric plants. It has completed four major and a number of smaller hydroelectric projects throughout the island republic.

Three of the major plants are located on Luzon and serve the markets in Manila, the Baguio mining area, and the rich and populous Central Plains of Luzon.

The Ambuklao and Binga projects, with a total installed capacity of 175,000 kw, are located on the Agno River near Baguio, 180 miles north of Manila. The 36,000-kw high-head Caliraya plant is located 45 miles southeast of Manila.

Power from Angat will feed into the high voltage Luzon transmission grid of NPC, which interconnects its three existing plants with thermal capacity of the Manila Electric Company (MERALCO).

The 50,000-kw Maria Christina hydroelectric plant of NPC is located on the island of Mindanao and serves large industrial loads principally. NPC also plans an immediate large expansion at that plant.

Forty percent of the $64.5-million cost of the Angat hydroelectric project will be foreign exchange. NPC plans to borrow $25 million from the International Bank for Reconstruction and Development (IBRD).

Revenues from wholesale power sales will pay the interest charges and amortize the loans in less than 30 years. NPC will receive no payments from other benefits.

The National Power Corporation retained the Harza firm in joint association with the Engineering and Development Corporation of the Philippines, Manila. Harza will provide consulting engineering services to assist NPC's staff in the design and engineering supervision of construction of the Angat project. The construction and equipment supply will be bought by international bidding.

How you can cut structural steel costs with new design RB&W High Strength Bolts

In any type joint, you save one hardened washer out of every two by using RB&W High Strength Bolts with new head and thread design.

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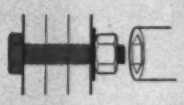

This sketch shows why. The new bolt has shorter thread length. Shear planes pass through full shank section only, thereby enabling the full, allowable shear strength of the bolt to be utilized. The new larger head furnishes extra bearing area to prevent crushing when bolt is torqued up to its full recommended tension. Only one washer is needed . . . under head or nut whichever is rotated in wrenching.

The AISC approves this fastening breakthrough. It has been fully tested and approved by the Research Council on Riveted and Bolted Structural Joints. The sooner that structural engineers work it into their new designs, the sooner everybody benefits. Building owners benefit through lower costs; construction shop fabricators benefit through more tonnage assembled faster with existing shop space; erectors benefit through fewer holes to fill and less material cost.

Consult us for more details on these bolts that have *certified* quality. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

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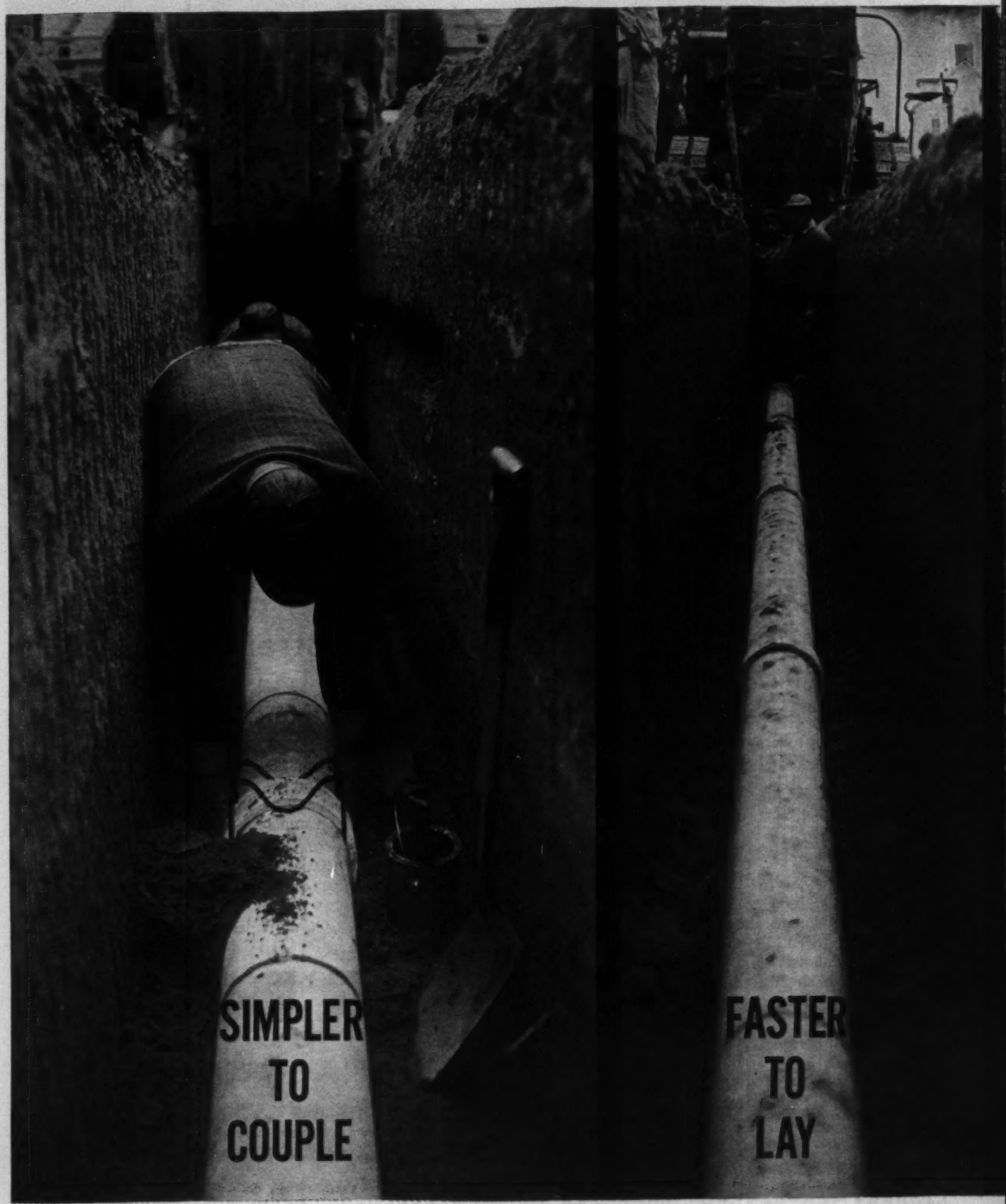

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With the completion of the new sewer installation in New Jersey's thriving town of Marlton, Clyde Fear of Gray & Fear, contractors, had lots to say about "K&M" Asbestos-Cement Sewer Pipe. Here's what he told us. "You're money ahead with "K&M" Asbestos-Cement Sewer Pipe. Our men like the simple "K&M" couplings that slide in fast without any heavy machinery, and, believe us, that's one place where we save time and money. These simple coupling joints go miles faster. The pipe is easy to handle; there's less breakage on the job or in the storage yard. No lost time because of bad weather, either, because we can lay and couple this pipe in muddy trenches."

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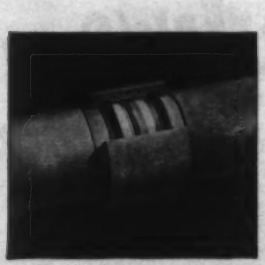
Write today for more information on "K&M" Asbestos-Cement Sewer Pipe. Write to: *Keasbey & Mattison Company, Ambler, Pa., Dept. P-1390.*



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"K&M" Asbestos-Cement Sewer Pipe installation, Marlton, N. J.; Engineers: Sherman, Taylor & Sleeper, Merchantville, N. J.; Contractor: Gray & Fear, Woodbury, New Jersey.

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Pipe plants at Ambler, Pa.—St. Louis, Mo.—Santa Clara, Cal.

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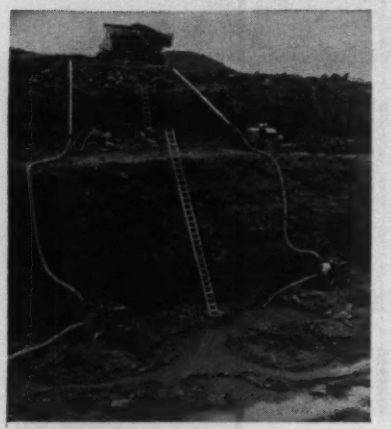

These engine-driven Marlow self-priming pumps operate on a 24-hour schedule to control seepage water.

The giant Niagara Power Project called for the construction of a $141,000,000, four-mile-long conduit waterways system. Trenches were dug in four separate sections to accommodate huge 46 foot by 66 foot concrete conduits. They will carry water from the upper Niagara north to the Tuscarora Pumping and Generating Plant.

When seepage water became a serious problem on one section, Merritt-Chapman & Scott Corporation installed big Marlow self-priming pumps to keep the area workable. On another section of the project, Gull Contracting Company and L. G. Defelice and Sons, Inc. used Marlow self-primers in the trenches. Operated to carry water over a 75-foot embankment, these pumps handled 90,000 GPH on continuous service.

In addition to a complete line of AGC rated pumps, Marlow also builds the famous "Mud-Hog" diaphragm pump. For full information, write today for Bulletin C-09 and the name of your Marlow dealer.

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Roofing 'Shot from Guns'

Any size or shape roof structure—from flat to the most advanced free-form—now can be weatherproofed economically with a single-layer monolithic coating, according to the manufacturer.

With the "Monoform System" a roof contractor sprays a high-bond, glass-reinforced compound onto a clean surface in a single operation, instead of using the conventional method of building up roofing layers.

The system is based on the development of a lightweight, fast-action applicator, the "Sealzit" gun, and the development of special asphaltic compounds. The gun employs twin ejectors for the compounds, which work simultaneously with a separate ejector for glass roving or fibres. A pump and compressor force the coating material through hoses and ejectors controlled by a single trigger.

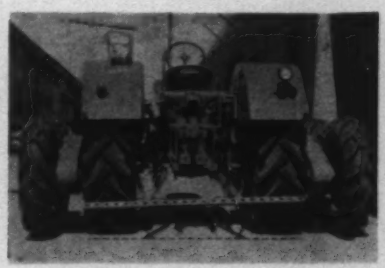
A three-man crew using the gun can install between 15,000 and 18,000 sq ft of material a day, compared to only 8,000 sq ft with a five-man crew using conventional methods, claims the manufacturer. The lighter weight of this seamless roof may provide greater economy in structural framing.

The roof coating can be combined with certain aggregates, such as crushed rock, vermiculite, sand, roofing granules, metallic powders and decorative flakes for special effects.

In addition to roof applications, the spray system is reported adaptable for waterproofing, insulation, maintenance and repair work.

Monoform roofs, applied by franchised applicators, are eligible for 20-, 15- or 10-year surety bonds, says the manufacturer.

Plans call for licensing the patented system and leasing the gun to roofing contractors. The Flintkote Co., 30 Rockefeller Plaza, New York 20, N. Y.



Tandem Bogie Wheels Give Tractor Six-Wheel-Drive

Bogie Power Wheels can be adapted to almost any standard wheel tractor. Two extra power wheels, chain-driven from the main axle, are attached outside each tractor drive wheel.

On each pair, one Bogie wheel sets slightly ahead and the other slightly behind the regular drive wheel. This arrangement of six drive wheels gives additional contact area, increased traction and greater side-hill stability. They are said to be easily attached and removed. Young Iron Works, 2959 1st Ave. So., Seattle 4, Wash.

(*New Products continued p. 56*)

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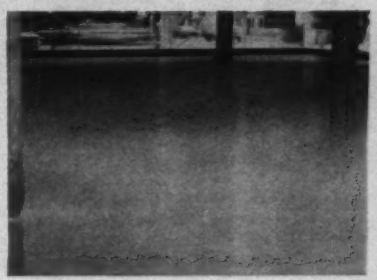
SEALS
DUSTPROOFS



Apply DEKOTE to freshly troweled concrete floors by spraying, brushing, or by roller, and you get a floor that looks better, is stronger, will last longer and be easier to maintain.

DEKOTE, as a curing agent, retains 95% of the moisture in concrete to assure positive, complete hydration for maximum strength and hardness. It effectively seals concrete surfaces against most acids, oils, greases, and other foreign materials. Objectionable dusting, usually found in untreated concrete is eliminated.

Paints and tile adhesives may be applied to DEKOTE-treated floors without removing the DEKOTE membrane.

DEKOTE is a clear, fast-drying material that imparts a smooth, natural lustre to concrete that makes it easy to maintain and clean.

For complete information and specifications on this new concrete floor treatment, write for DEKOTE T 130 Catalog Sheet.

TRETOL INC.
Quality
Products for Concrete and Masonry
7252 W. 66th STREET, CHICAGO 38, ILLINOIS

POSEY WORKS FOR BETTER-

AUTOCLAVES

Our capabilities include pressure vessels of all types, such as special vulcanizers and autoclaves. Engineering service available.

For FREE 16-page illustrated catalog on Industrial Heating applications, write:

POSEY IRON WORKS INC.

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DIVISIONS:
• Iroquois Asphalt Plants • Mixers and Blenders
• Tunnel Forms • Industrial Heating • Foundry
• Large OD Steel pipe

561 S. PRINCE STREET LANCASTER, PA.

Self-leveling level saves up to 50% surveying time

The Ertel Level, proved successful throughout the United States, automatically assumes a truly horizontal line of sight once it has been approximately leveled by its circular bubble.

The self-leveling system consists of two carefully-positioned prisms which are moved by a gravity-operated pendulum to a precise realignment with any accidental change of instrument setting—such as one tripod leg sinking into soft soil. *During extensive leveling operations, the instrument cuts working time as much as 50%.*

The Ertel INA Level—made in West Germany—is 5⅛" high; has a 30x telescope; weighs 19¼ lbs. (including tripod). Write for Bulletin INA which gives complete data.

PRECISION INSTRUMENTS INC.
1900 FIFTH AVENUE, TROY, NEW YORK

Horizontal Drive for Hoists

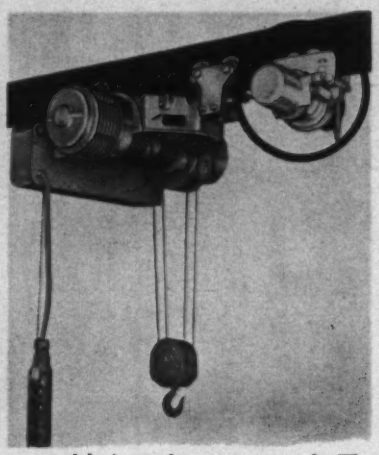
A hoist tractors pulls loads of 13,000 lb at speed up to 60 ft per sec for Monorail mounted overhead hoists.

The P&H Pull-A-Hoist is designed to power any make of hoist along any standard I-beam or wide flange beam.

It weighs only 83 lb., requires only 12 in. of head room and uses just 13 in. of rail space for end approach. Because it is compact, installation presents no problem on existing overhead hoists. A special soft-start motor and adjustable torque brake minimize any tendency of load jerking or swaying, regardless of the load size.

The tractor motor transmits power to the underside of the carrying beam through a solid, neoprene-tired drive wheel, which is under adjustable spring pressure. The maker says this provides the Pull-A-Hoist with more positive tractive power than is possible from a conventional pneumatic-tired wheel.

The unit is available with single or two-speed controls, with option from separate pushbutton control or from integrated hoist and tractor control.



The standard model is a single-speed, 220-volt, three-phase, 60-cycle assembly. Options range from 110 volt up to 550 volt and 50 cycle instead of 60 cycle where required. HARNISCHFEGER CORP., 4444 WEST NATIONAL AVE., MILWAUKEE 46, WIS.

Roto-Hammer Has Triple Action

Electric Roto-Hammers will do three distinct operations—hammering with simultaneous power rotation, hammering without rotation, and drilling without hammering.

The three-way operation is accomplished by a combination of electropneumatic drive and a constantly rotating inner barrel. Instead of a spring or other connecting part, the hammer action is provided by powerful air pressure built up between the piston and striker. The electro-pneumatic drive provides a steady, powerful hammer action with low vibration according to the manufacturer.

Locking a carbide bit with hexagon shank into the inner barrel nose, the Roto-Hammer provides a combination hammering and automatic rotation action. Hammering and chiseling tools with round shanks allow the hexagon nut in the inner barrel to revolve freely and converts the tool to hammering action only.

For drilling without hammering, a short shank chuck adapter goes into the hammer nose, permitting the hammer striker to fall below its vacuum chamber and to remain inactive.

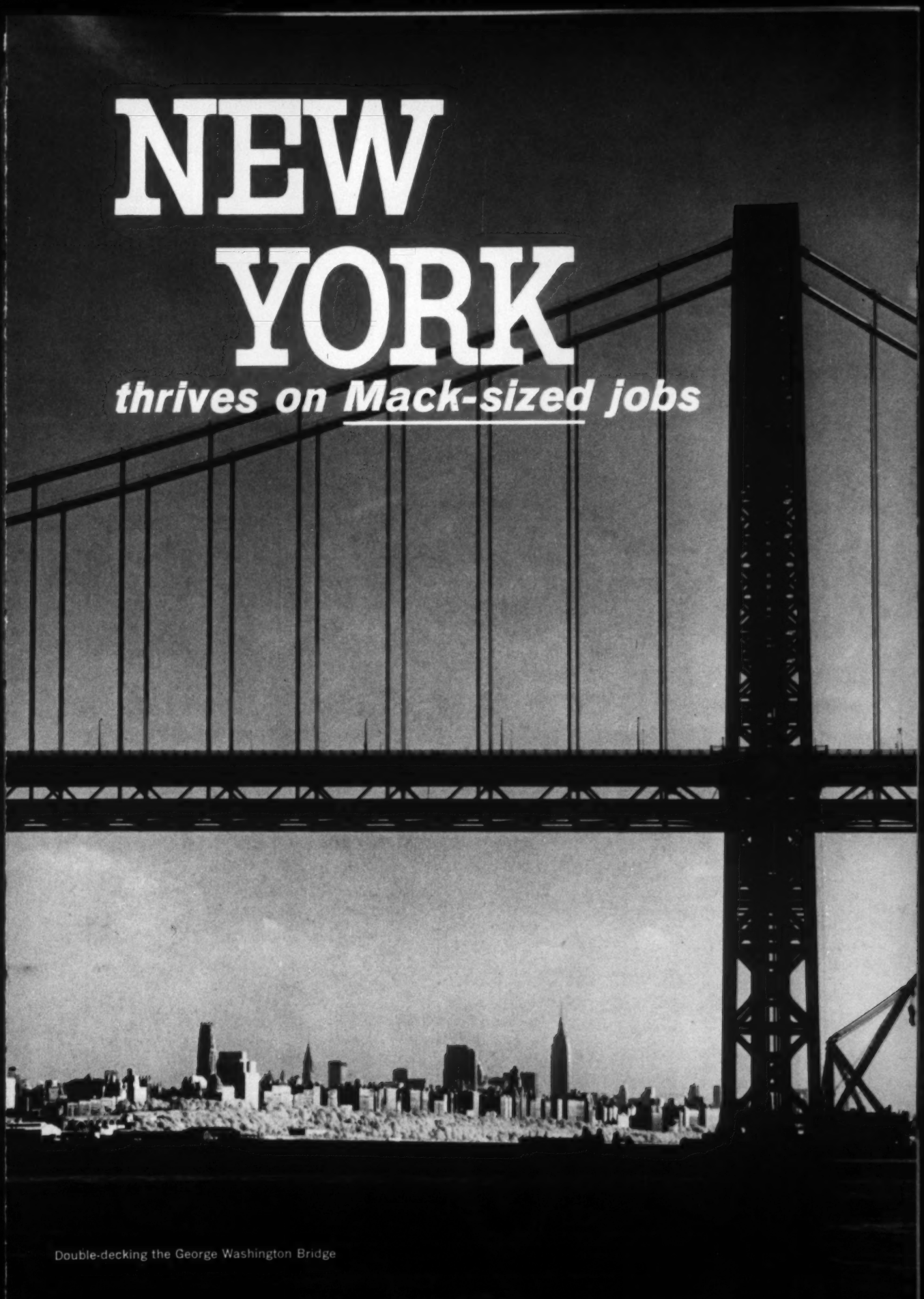
The design of the electropneumatic drive also eliminates many service problems commonly associated with electric hammers, the maker says. Since there is no direct contact between the piston and striker there are no parts to break or wear from impact.

The hammer is available in two models. Model 726 is for general contracting work requiring ¾-in. to 1-in.-dia holes. Model 736 will cut 1- to 2-in. holes and is suitable for heavy demolition work. Both models come in an all-steel carrying case containing a depth gage, Allen wrench, tool retainer, side handle, oil can and dust shield for overhead protection, plus a sample carbide bit. SKIL CORP., 5033 N. ELSTON AVE., CHICAGO 30, ILL.

Ventilator-Heater Useful In Underground Work

The 1960 MoPeCo Model PE-G is designed for year-round ventilation, delivering heated fresh air in winter and fresh air in summer. Capacity is 300 to 800 cu ft per minute. Air is heated in a heat exchanger and all products of combustion pass into the atmosphere through the burner exhaust. The engine is fueled with propane.

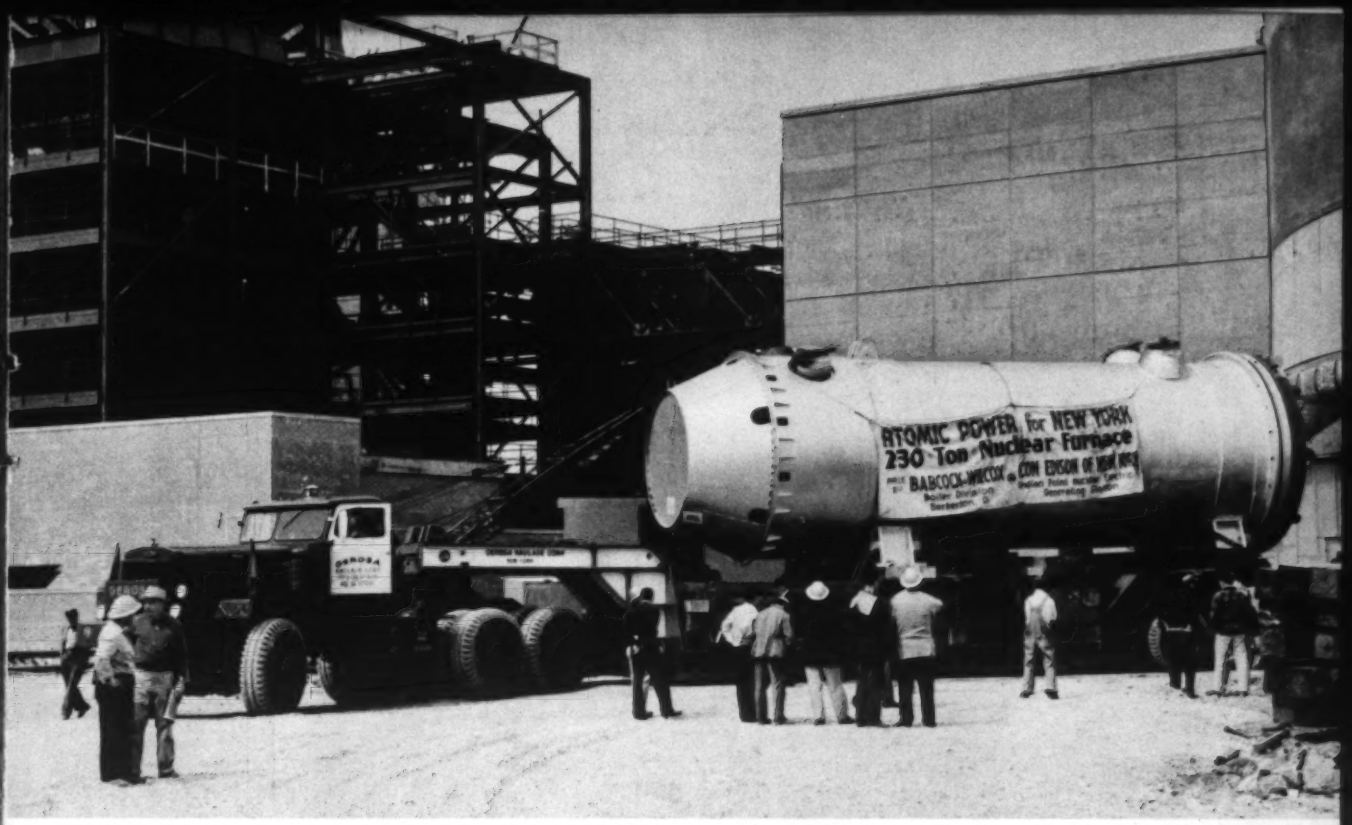
The portable unit weighs 78 lb. A 300-watt generator is attached for electric light or soldering iron, and electric outlets on the generator are protected by a waterproof weatherguard. MORRISON-PELSUE CO., 2001 SOUTH BANNOCK ST., DENVER 23, COLO.



Double-decking the George Washington Bridge

M. J. Torpey, Inc., digs into New York's bedrock to prepare the new Manhattan approach to the George Washington Bridge. Mack dumpers are favorites on this kind of rock job because of their ability to take the day-in, day-out pounding under the shovel and because they have the power and traction for the steep pit pullouts.

The Big City



The world's largest plant to use atomic energy for the production of electricity is nearing completion at Indian Point, a short way up the Hudson from New York City. Consolidated Edison Co. relies on Gerosa Haulage for the experience and know-how to handle heavy tonnage units . . . and Gerosa relies on Macks. Big Mack in picture is hauling the 230-ton nuclear furnace.

keeps growing bigger...

East side, west side, all around the town . . . New York keeps digging, building, growing. Giant new buildings plug the gaps in the skyline—new expressways are carved into the suburbs—a hanging highway crosses the Hudson suspended below a great bridge.

Wherever you turn in New York, the city teems with building activity—and with Mack trucks. Why so many Macks on these jobs? There are plenty of good reasons. For instance, Mack makes a truck that gets jobs done—not just when the going's good, but under *all* conditions. Not just when it's new, but long after other so-called heavy-duty vehicles have outlived their usefulness. A Mack truck can do this because of Mack Balanced Design . . . the exclusive Mack practice of building its own quality components. Built for Mack trucks alone, they work together with unequaled efficiency and longest life.

Time and again experienced operators have solved the problem of high truck operating costs by turning to quality Mack equipment. Whether to increase your hauling capacity or to take on an unusually tough assignment, there's a Mack model ready to help put more profit in your operation. Your local Mack branch or distributor is the man to see.

Old hands at the construction of the new expressways smoothing travel between New York City and its expanding suburbs, Tully & DiNapoli, Inc., works its big Mack fleet on numerous jobs throughout the Metropolitan area.

and Bigger...

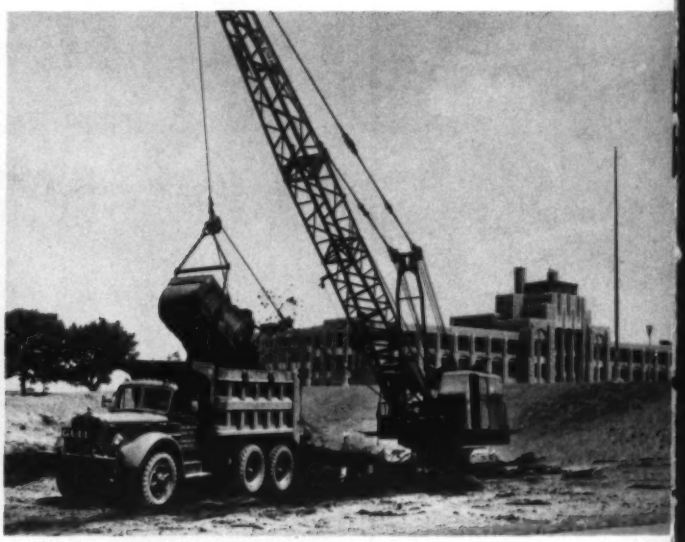
OVER AND UNDER: Mounting traffic problems of New York's northern approaches mean large-scale alterations to Bruckner Blvd. Round-the-clock operations by the Mack fleet of Slattery Contracting Co., Inc., helped keep the big job on schedule.

MORE POWER TO N. Y.: Growth of Manhattan's east side brought the need for more power. Thousands of tons of rock were hauled by the Macks of Poirier & McLane Corporation during the construction of this giant generating plant of the Consolidated Edison Co.

and Bigger!

with MACKS

NEW BOTTOM: 100,000 motorists a day cross the George Washington Bridge—often get jammed up on it. To help relieve these jams, a new six-lane roadway is being suspended below the existing bridge. Geo. M. Brewster & Son, Inc., one of the major firms at work on the multi-million dollar project, uses Macks on its heavy-duty jobs.



BUILDUP FOR EDUCATION: Handsome new educational facilities at St. John's University will help take care of New York's ever-growing student population. Gull Contracting Co., Inc., flattens acres of land for new athletic fields with the help of dependable, economical big capacity Mack dumpers.

MACK FIRST NAME FOR **TRUCKS**

Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario

MACK for over 7 straight years NO. 1 by far in sales of diesel trucks

Printed in U.S.A.

7485

Pre-fab pump stations set underground for . . .

California Sewer Project

To provide a collection system in a California community with no existing sewers, the Linda County Water District, Yuba County, is spending $1,307,650 for trunk and sanitary sewers and four deep underground pumping stations. Dean S. Kingman, Palo Alto, is the consultant.

Bids were taken on six separate units of the system. Only five bidders priced the entire job. The award to E. T. Haas Co., Belmont, Calif., was 3% over the engineers estimate, and breaks down like this:

Unit	Description	Amount
1	Trunk sewers	$239,753.25
2	Sanitary sewers	356,499.85
3	Sanitary sewers	287,665.70
4	Sanitary sewers	322,727.60
5	Pump stations & ejector station	53,000.00
6	Sanitary sewers	66,070.00
	Total bids	$1,325,716.40
	Less deduction for award of combination of awards on Units 1-4	18,066.40
	Total award	$1,307,650.00

The vitrified clay sewer pipe is extra strength, with hot poured joints or factory-made compression joints. Pipe sizes range from a minimum of 6 in. to a maximum, for the trunk sewers, of 27". Sewer laterals are 4 and 6 in. Sewer depths will vary from 5 to 15 ft.

Soil in the area is granular except for occasional streaks of hard pan, and ground water table is below all excavation.

Because the terrain is flat, four factory-built underground pumping stations will be set on concrete slabs approximately 25 ft below ground. Each station will have two pumps—those in three stations 5HP, and those in the remaining station 7½ HP.

Concrete jackets, poured in trench bottom for the vitrified clay pipe bedding, must contain 4 sacks of concrete per cu yd.

Cast iron pipe is AWWA C106-53, with thickness based on AWWA C101-57 for 150 psi working pressure, 21,000 psi bursting tensile strength, and 45,000 psi modulus of rupture.

Wages include: carpenter, $3.78; sewer pipe layer, caulker & bander, $3.295; general laborer, $3.045; crane & power shovel operator, $4.19, increasing to $4.43 on July 1.

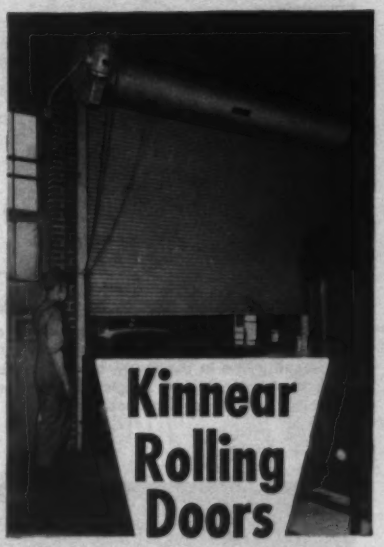
The bidding included:

1C	E. T. Haas Co., Belmont, Calif.	$1,307,650
2	Fred J. Early, Jr. Co., Inc., San Francisco	1,455,768
*5	Granite Constr Co., Monterey, Calif.	1,904,129
EE	Dean S. Kingman, Palo Alto, Calif.	1,266,370

* Four other bidders did not price the entire 6 units.

Bids: 8-8-60 Items	Unit	Quantity	Unit Prices 1 C	 2
Trunk Sewer				
Clay pipe sewer, 27"	lf	3,683	$19.75	$22.00
24"	lf	7,823	18.00	19.35
lateral, 6"	lf	100	4.25	3.40
4"	lf	1,600	3.75	2.90
Manhole, incl stubs, 4-10'	ea	7	280.00	375.00
drop, 4-10'	ea	1	380.00	700.00
deep, over 10'	ea	17	425.00	445.00
deep drop, over 10'	ea	6	525.00	775.00
Wye branch, 27"	ea	27	110.00	117.00
24"	ea	34	85.00	90.00
Concrete jacket	cy	40	30.00	55.00
Sanitary Sewers				
Unit 2				
clay pipe sewer, 15"	lf	1,523	9.00	10.20
10"	lf	2,779	6.10	5.85
8"	lf	21,087	4.65	5.05
6"	lf	24,891	4.00	4.60
lateral, 6"	lf	900	4.25	3.40
4"	lf	21,400	3.50	2.90
CIP force main, 8"	lf	792	5.20	6.50
MH, incl stubs, 4-10'	ea	105	250.00	300.00
deep, over 10'	ea	21	400.00	360.00
deep drop, over 10'	ea	6	500.00	450.00
riser	ea	10	60.00	100.00
wye branch, 15"	ea	21	40.00	42.00
10"	ea	33	15.00	18.00
8"	ea	305	8.00	9.15
6"	ea	360	5.00	5.55
concrete jacket	cy	50	30.00	50.00
Unit 3				
claypipe sewer, 24"	lf	216	20.00	18.35
21"	lf	1,697	17.00	16.05
18"	lf	2,630	15.00	12.05
15"	lf	4,346	11.00	10.20
12"	lf	1,381	7.50	8.10
10"	lf	4,406	6.70	5.85
8"	lf	6,065	5.00	5.05
6"	lf	2,862	4.50	4.60
lateral 6"	lf	600	4.75	3.40
4"	lf	2,000	3.75	2.90
MH, incl stubs, 4-10'	ea	35	280.00	300.00
deep, over 10'	ea	24	425.00	360.00
deep drop, over 10'	ea	2	525.00	500.00
riser	ea	1	60.00	100.00
wye branch, 24"	ea	3	85.00	90.00
21"	ea	1	70.00	75.00
18"	ea	1	55.00	60.00
15"	ea	47	40.00	42.00
12"	ea	2	20.00	22.00
10"	ea	2	15.00	18.00
8"	ea	20	8.00	9.00
6"	ea	15	5.00	6.00
CIP force main, 12"	lf	1,568	8.00	12.25
8"	lf	1,045	6.00	9.50
bore & jack 10 ga WS pipe, 36" & instal 20" CIP	lf	82	65.00	75.00
24" & instal 10" CIP	lf	50	40.00	50.00
12" CIP	lf	221	45.00	42.00
18" & instal 8" CIP	lf	166	35.00	35.00
bore & jack 24" galv CMP & instal 12" CIP	lf	109	35.00	60.00
conc jacket	cy	150	30.00	50.00
Unit 4				
clay pipe sewer, 12"	lf	3,190	6.30	8.10
10"	lf	477	5.70	5.85
8"	lf	22,624	4.50	5.05
6"	lf	23,873	3.90	4.60
lateral, 6"	lf	500	4.15	3.40
4"	lf	14,500	3.50	2.90
CIP force main, 8"	lf	96	6.50	15.00
MH, incl stubs, 4-10'	ea	92	280.00	300.00
deep, over 10'	ea	30	400.00	360.00
deep drop over 10'	ea	10	500.00	500.00
riser	ea	9	60.00	100.00
Wye branch, 12"	ea	1	20.00	22.00
10"	ea	1	15.00	18.00
8"	ea	280	8.00	9.00
6"	ea	275	5.00	6.00
conc jacket	cy	220	30.00	50.00
Unit 6				
clay pipe sewer, 12"	lf	7,500	7.00	8.10
MH, incl stub, 4-10'	ea	4	280.00	300.00
deep, over 10'	ea	15	500.00	400.00
conc jacket	cy	165	30.00	50.00
Pump Stations				
#1, complete	ls	job	$13,000	$18,000
#2, complete	ls	job	12,000	15,500
#3, complete	ls	job	12,000	15,750
#4, complete	ls	job	12,000	16,200
Ejector station, complete	ls	job	4,000	3,850

Commence: Immediately upon award
Complete: 12-9-60



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Kinnear originated the efficient door curtain of **interlocking steel slats**...introduced the **single-shaft torsion spring** that gives **uniform** regulation of operating ease from a **single adjustment wheel.** Kinnear's **coiling upward action** is your best investment in doorway service and protection! Write for free catalog!

The KINNEAR Manufacturing Co.

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Saving Ways in Doorways

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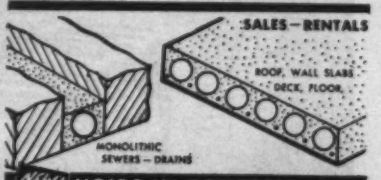

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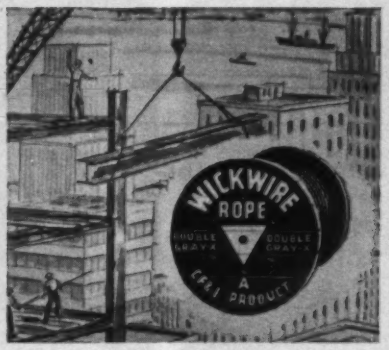
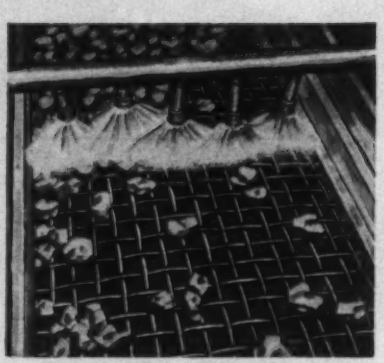
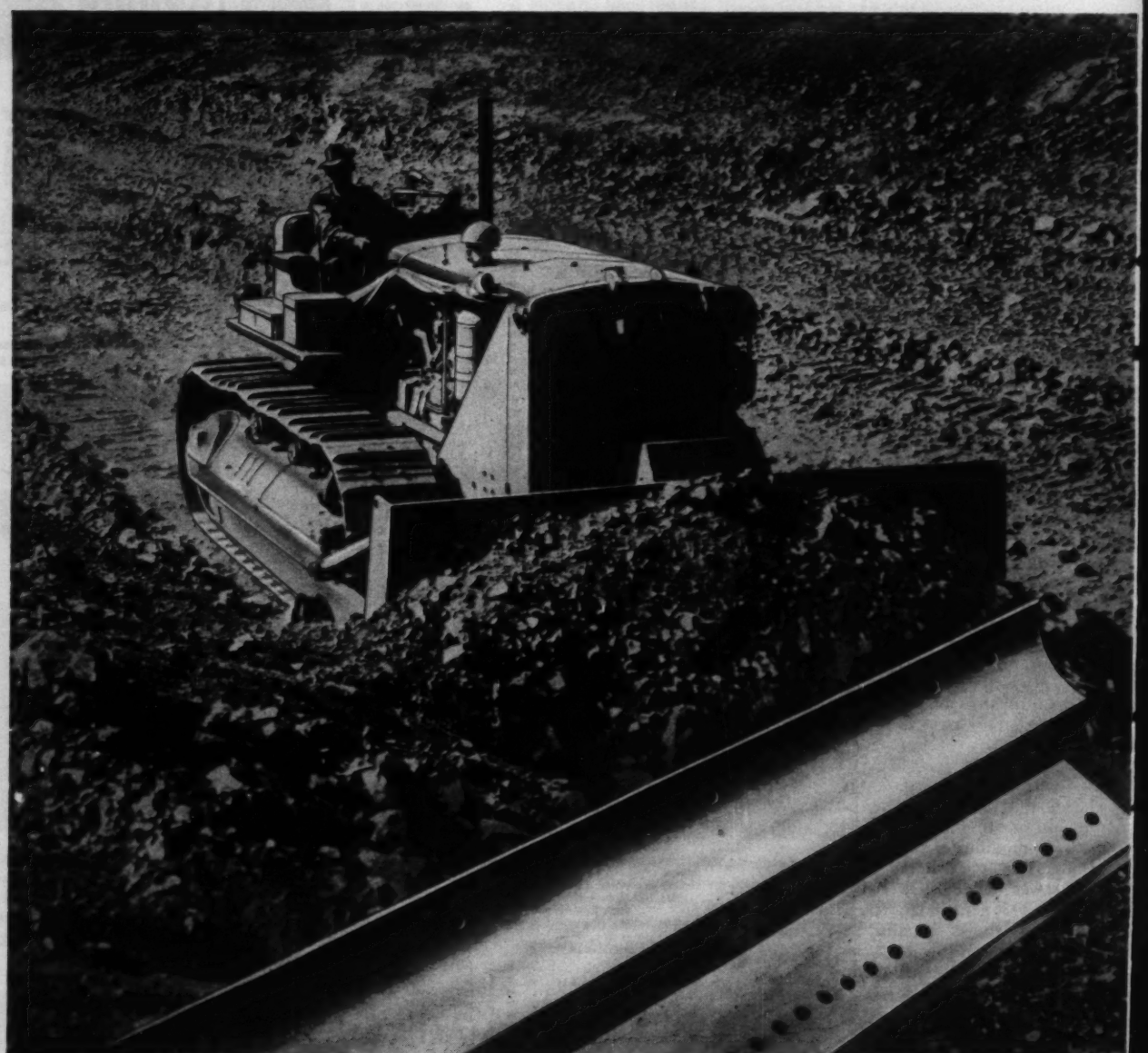
CAL-TIE WIRE – For fast tying of rebars or welded wire fabric, equip your workers with this quality wire in the handy, belt-borne reel. Wire can't snag, kink or tangle and there are no loose ends to scratch hands or face.

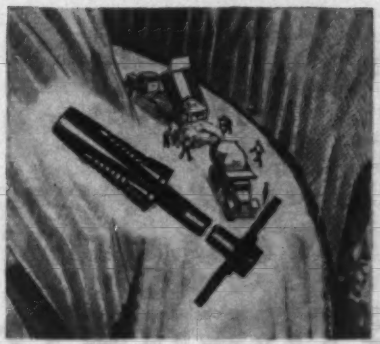


WIRE ROPE – There's a CF&I-Wickwire Rope or Sling for every type of construction job. These tough, rugged ropes withstand plenty of punishment. They are available in many constructions, sizes and grades. For extra safety, extra strength and longer life, specify Double Gray-X.

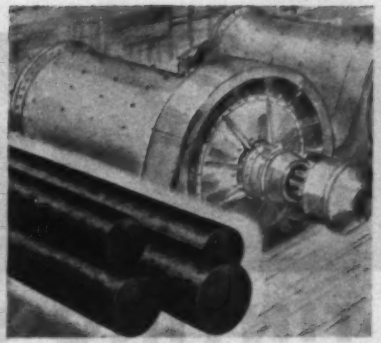


VIBRATING SCREENS—You get your choice of metals, weaves, meshes and edging to suit any type of sizing operation or any vibrating equipment. The long life of CF&I Space Screens allows you to operate at minimum cost per ton screened.

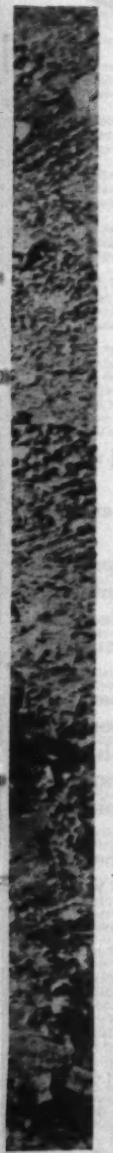




ROCK BOLTS AND METALLIC FABRIC – For safe, dependable lagging in tunnels and through cuts use CF&I Rock Bolts. Realock Metallic Chain Link Fabric gives essential support between bolts and protects against falling rocks or slides. Rock Bolts are available in either expansion type with Pattin Shell or in slot-and-wedge design.



GRINDING RODS—Made from special analysis high carbon steel, CF&I Grinding Rods are rolled to close section tolerance. These rods, manufactured specially for processing of sand and gravel, are then machine-straightened to insure uniform rotation needed for good grinding. These rods will not bend or break prematurely.



Depend on CF&I's Family of Steel Construction Products

On projects everywhere, construction men keep the work humming with CF&I Steel Products. Long-range dependability—as symbolized by our Corporate Image—is built into every CF&I product.

CF&I makes steel products that are widely used right on construction job sites—products like tie wire, wire rope, rock bolts, grader blades and many others. Contractors also use other CF&I products – such as grinding rods and vibrating screens – for preparation of materials.

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Other CF&I Products for the Construction Industry

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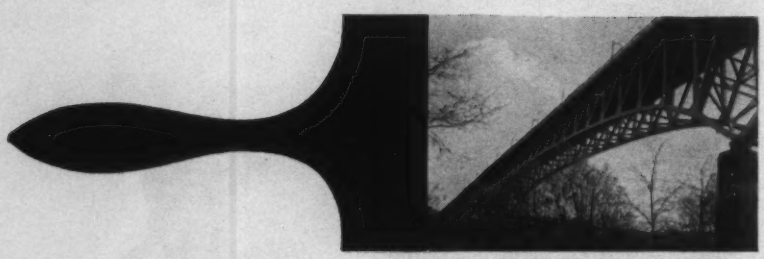
For complete information on all products, ask for Catalog G-104, "CF&I Steel Products for the Construction Industry."

THE COLORADO FUEL AND IRON CORPORATION

DENVER • OAKLAND • NEW YORK

CF&I STEEL

GRADER BLADES—Scientifically designed, CF&I Grader Blades and Cutting Edges are carefully manufactured to give long service. They are free from hard and soft spots, and holes are cold drilled and punched. Available in a wide variety of lengths, widths, thicknesses and hole spacings.



You get LOW TINTING STRENGTH

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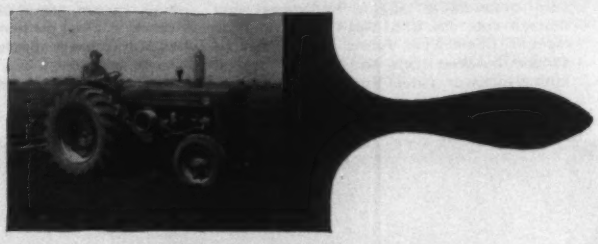

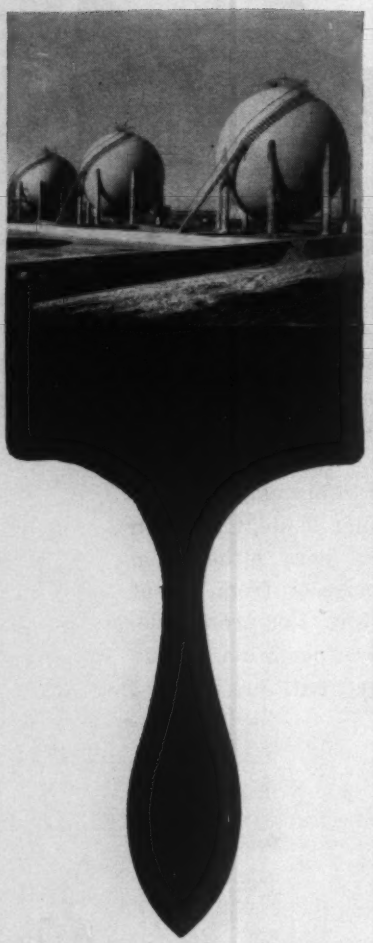

EAGLE-PICHER PERMOX® 1-4-3 (Basic Lead Silico Chromate)

Permox 1-4-3 is not only an outstanding metal protective pigment, it also has very low tinting strength.

This property of low tinting strength makes possible the production of economical, durable and decorative anti-corrosive maintenance paints and enamels in an almost unlimited range of colors. These can vary from deep tones to pastels, without sacrificing rust inhibiting qualities.

Since Permox 1-4-3 is designed to go in all three paint coats, maximum protection against rust becomes *cumulative*. Furthermore, this use of a protective pigment in each coat minimizes the possibility of corrosion arising from skips and holidays during application, and permits the use of an anti-corrosive finish coat for both spot priming and finishing.

Suggested formulations are available for a wide variety of these anti-corrosive and decorative paints designed for specific needs. We welcome inquiries and are prompt to respond.

Permox 1-4-3 Conforms to ASTM Specification D-1648

Since 1843

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Cincinnati 1, Ohio
Regional sales offices: Atlanta, Chicago, Cleveland, Dallas, Kansas City, New York, Philadelphia, Pittsburgh

West Coast Sales Agent, THE BUNKER HILL COMPANY, Chemical Products Division • Seattle • Portland • Oakland • San Francisco • Los Angeles

Materials Prices

Monthly Market Quotations by ENR Field Reporters

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. struc-tural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.50	$5.30	$5.675	$12.25	.....	$110.00	$130.00	$6.975	$9.75	$6.00	.....
Chicago Area	5.50	5.30	5.675	12.25	$6.50	110.00	130.00	6.975	9.75	6.00	.....
Pittsburgh Area	5.50	5.30	5.675	12.25	6.50	110.00	130.00	6.975	9.75	6.00	$14.75
Buffalo Area	5.50	5.30	5.675	12.25	6.50	110.00	130.00	6.975	9.75	6.00	14.75
Cleveland	.....	.....	5.675	12.25	6.50	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.675	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.50	5.30	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	6.30	.....	6.375	.....	6.50	.....	.....	.....	9.75	6.875	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	69.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	STRUCTURAL SHAPES Extras W	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	EXPANDED METAL LATH Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fab mill
Atlanta	7.20–8.20*EvV	Quantity extras per cwt.: Items: 10,000# and over, base; 5,000—9,999#, +10¢; 2,000—4,999#, +15¢; 1,000—1,999#, +25¢; 400—999#, +$1.75; under 400#, +$3. Order: 20,000# and over, base; 10,000—19,999#, +10¢; 5,000—9,999#, +20¢; 2,000—4,999#, +50¢; 1,000—1,999#, +$1.25; 400—999#, +$2; under 400#, +$3.	8.75	$8.75	53.00	57.00	EXTRAS, per cwt—Quantity (applies to LCL shipments only): under 1,000#, +$1.50; 1000–1999#, +$1.30; 2000–4999#, +90¢; 5000–9999#, +70¢; 10,000–19,999#, +50¢; 20,000–39,999#, +30¢; 40,000# & up, zero. Size: bars⅞ and larger, +$2.50; ⅝ to ¾, +$1.40; ½ +$1.00; #5 +70¢; #4, #3, #2, +50¢; light rail, +$2.50 (except in New York City and surrounding metropolitan area where bending must be done on the job). Fabricating (details and placing from designs by others): over 500 tons, +45¢; 200–500 tons, +50¢ but not over $4500; 75–199 tons, +65¢ but not over $3000; 20–74 tons, +75¢ but not over $975; 5–19 tons, +$5 but not over $300; under 5 tons, +$1.00 but not over $90. Min. charge $25. Design only: +60¢.
Baltimore	9.70		9.00T	.....	44.50	49.00	
Birmingham	9.00ty		8.50–9.94tyV	8.50–9.94tyV	61.00pK	67.00pK	
Boston	8.21–9.31KssV		8.75t	8.75t	49.50K	54.00K	
Chicago	6.96–8.23ysV		6.90–7.00ysV	6.90–7.00ysV	52.00tU	63.00tU	
Cincinnati	7.52–8.79skrysV		8.16tt	.....	44.50Kq	49.00mnKq	
Cleveland	7.35–8.62styvV		7.14st	.....	46.50KL	51.00KL	
Dallas	7.71–9.40MsV		9.00	9.00	44.00u	48.50u	
Denver	10.16cK		9.25c	.....	63.00n	69.00n	
Detroit	7.52–8.79RMsV‡		7.37Q	11.85Q	67.00O	74.00O	
Kansas City	8.78sT		8.21N	.....	51.00	55.00	
Los Angeles	8.44–9.50dlsV		7.35frt	.....	55.00S	64.00S	
Minneapolis	7.78–8.17ysV		9.36T	9.36T	44.50K	49.00K	
Montreal	7.90–8.80CP/8.20–8.90AiP		7.00/7.50PGN	7.00/7.50PGN	65.70h	70.20h	
New Orleans	.....		8.00gius	.....	50.00K	55.00K	
New York	8.02–8.84VssV		8.00ty	8.00y	52.00n	59.00nv	
Philadelphia	7.60–8.40bsysV		8.23uy	8.23y	44.50tU	55.20tU	
Pittsburgh	6.96–8.23ysV		7.35y	.....	58.50tvo	64.50tvo	
St. Louis	7.19–8.45stryV		7.35‡‡sQ	7.35‡‡sQ	61.00svxK	69.00svxK	
San Francisco	8.43–10.34ssV		9.85SN	.....	53.00S	58.00S	
Seattle	8.30–10.49aDsV		8.85DM	.....	47.00‡‡xD	73.50‡xD	
Toronto	9.20H		7.40	7.40	40.50mnI	44.85qJ	

	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fab mill
4 × 18 in., No. 5 & 10 wires—Joliet, Ill., Donora, Pa., Monessen, Pa.	$7.04
4 × 12 in., No. 8 & 12 wires—Joliet, Ill., Donora, Pa., Monessen, Pa.	$3.63
6 × 6 in., No. 6 & 6 wires—Joliet, Ill., Donora, Pa., Monessen, Pa.	$4.17

*‡ Delivered ** Aver. of Canadian & American */ add 4% sales tax *a 2000–4999# *b 10,000–19,999#, fob city *c 20 tons or over *d 10,000–29,999# *e Intermediate struct'l *f Incl. delivery in free zone *g CL *h list price; dominion tax exempt; add provincial and municipal taxes *i add provincial and municipal sales taxes *j Intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m cooper alloy *n LCL *o asphalt coated *p 500 sq. yd. or more *q 2.5 lb *r less 2% disc. for cash *s 10,000# item in 20,000# order *t less ½% disc. 10 days *u add 10¢ extra *v incl 15¢ del. *w truck lots. *x add 2% sales tax *y add 15¢ del. *z add 10¢ del. *A American made. *C Canadian made. *D ½% for cash. *E 30,000# or over. *F Federal tax exempt for bldgs. *G add 10¢ del. *H 8.85 without tariff charges. *I 3 lb $60.00. *J 4 lb $47.50. *K less 2% disc. 10 days *L F.o.b. Youngstown plant *M 5,000–9,999# *N 2,000–19,999# *O 100 sy lots *Q 5 tons to CL *R: revised *S less 2% disc. 10th *T less ½% disc. 10th of mo. *U less 2% disc 10 days *V varies according to type and size *W Chicago, Cincinnati, Cleveland, Dallas, Detroit, New York, Philadelphia, St. Louis, and Pittsburgh.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEX‡	ASBESTOS CEMENT PIPE † per lin. ft. 6" Press Cl. 150	ASBESTOS CEMENT PIPE † per lin. ft. 12" Sew Cl. 1500	CLAY SEWER PIPE Per ft., delivered, car load ASTMC 13-55 8 in.	CLAY SEWER PIPE Per ft., delivered, car load ASTMC 13-55 12 in.	CLAY SEWER PIPE Per ft., delivered, car load ASTMC 200-55T 24 in.	CLAY SEWER PIPE Per ft., delivered, car load ASTMC 200-55T 36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTMC 4-55 6 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTMC 4-55 8 in.	CONCRETE SEWER PIPE◊ Per ft., delivered ASTMC 14-55 12 in.	CONCRETE SEWER PIPE◊ Per ft., delivered ASTMC 14-55 24 in.
Atlanta	130.5	$1.52/1.60	$2.36/2.48	$0.55r	$1.04r	$4.50r	$12.60r	$209.00sr	$334.00r	$0.95mKr	$3.75mKr
Baltimore	140.1	1.61/1.69	2.19/2.30	.665	1.20	3.05	12.71	187.80	289.20	1.01	2.75
Birmingham	135.8	1.53/1.69	2.36/2.37	.50r	.95r	4.14rv	13.50rv	295.00rz	430.00rz	1.75rS	2.75rS
Boston	143.1	1.63/1.71	2.19/2.30	.84qrtL	1.55qrtL	6.20qrtM	.....	244.00r	348.60r	1.56S	3.60S
Chicago	139.8	1.61/1.69	2.19/2.30	.93rw	1.78rw	7.53rw	21.16rw	220.00Rr	330.00Rr	1.30	4.00
Cincinnati	135.5	1.63/1.71	2.19/2.30	.658Rt	1.260Rt	4.95Rt	12.91R	177.50R	274.60R	.85rAB	3.25rAB
Cleveland	141.6	1.63/1.71	2.19/2.30	.66BCN	1.27tBC	5.47tBC	23.45tBC	179.40mBC	276.60mBC	1.35	2.40P
Dallas	137.8	1.63/1.71	2.36/2.37	.575‡‡B	1.09‡‡B	4.75‡‡B	10.53‡‡B	.....	.....	1.27BD	2.95BD
Denver	144.9	1.71/1.80	2.36/2.48	.56nr	1.00nr	4.99r	.....	460.00nr	640.00nr	1.05m	3.50m
Detroit	141.9	1.63/1.71	2.19/2.30	.97mk	1.86mk	7.48mk	19.95mk	212.00mk	327.00mk	1.40k	5.23k
Kansas City	138.5	1.63/1.71	2.36/2.37	.62r	1.125r	6.324hr	16.86r	315.00r	625.00r	1.70r	4.25r
Los Angeles	148.6	1.67/1.79	2.19/2.30	.825l	1.78blS	7.19blS	16.90blS	410.00lS	590.00lS	1.24wE	3.68/wE
Minneapolis	144.8	1.67/1.75	2.36/2.37	1.00oB	1.80oB	7.75oB	.....	.....	.....	2.19DFH	6.31DFH
Montreal	.....	.....	.....	1.13u	2.00u	7.00u	13.50u	288.00	545.00	1.17D	3.11/pD
New Orleans	132.3	1.61/1.69	2.36/2.37	.566r	1.078r	5.65r	.....	240.50yr	366.00	1.41iR	3.76iI
New York	138.5	1.63/1.71	2.19/2.30	.94	1.76R	12.89	35.61	240.81	369.84	1.50‡B	3.60‡B
Philadelphia	137.8	1.61/1.69	2.19/2.30	.721	1.401	9.021o	24.681o	220.00‡	330.00‡	1.50‡k	4.00‡k
Pittsburgh	143.7	1.63/1.71	2.19/2.30	.66K	1.27K	4.95K	12.92K	197 00	302.00	1.66DS	3.93DB
St. Louis	136.8	1.61/1.69	2.36/2.37	.62r	1.23r	5.10r	12.95rS	200.00r	350.00r	1.75i	4.05
San Francisco	148.6	1.67/1.79	2.19/2.30	.861d	1.861d	7.531d	18.001d	360.00‡‡	620.00‡‡	1.05‡Q	3.30‡Q
Seattle	149.0	1.71/1.80	2.19/2.30	.88kk	1.86kk	7.61k	.....	260.00kk	.....	1.90kv	4.50kv
Toronto	.....	.....	.....	.80F	1.50F	6.00F	.....	185.00F	305.00F	1.27F	5.19F

*WROUGHT STEEL PIPE

(Full standard weight)

Discount from list; see footnotes

	Galv. %	Black %	Galv. %	Butt Weld◊ Black %	Mill
Atlanta	+19.50/ +14.50s	+1.75/ 3.25s	+3.50 +1.50	13.75 17.25	
Baltimore	.....	.....	+3.50 +1.50	13.75 17.25	
Birmingham	.....	.....	+3.50 +1.50	13.75 17.25	
Boston	+14.50s	3.25s	+3.50 +1.50	13.75 17.25	
Chicago	+15.50s	3.25s	+3.50 +1.50	13.75 17.25	
Cincinnati	.....	.....	+16.50	0.75	
Cleveland	+14.50s	3.25s	+3.50 +1.50	13.75 17.25	
Dallas	+14.50s	3.25s	+3.50 +1.50	13.75 17.25	
Denver	+15.50s	3.25s	+3.50 +1.50	13.75 17.25	
Detroit	+13.50sh	3.25sh	+3.50 +1.50	13.75 17.25	
Kansas City	+14.50s	3.25s	+3.50 +1.50	13.75 17.25	
Los Angeles	+27.50sh	9.75sh	+16.50	0.75	
Minneapolis	.....	.....	+3.50 +1.50	13.75 17.25	
Montreal	.....	.....	+3.50 +1.50	13.75 17.25	
New Orleans	.....	.....	+3.50 +1.50	13.75 17.25	
New York	+19.50/ +14.50s	+1.75/ 3.25s	+3.50 +1.50	13.75 17.25	
Philadelphia	+14.50s	3.25sh	+3.50 +1.50	13.75 17.25	
Pittsburgh	+14.50s	3.25s	+3.50 +1.50	13.75 17.25	
St. Louis	+19.50/ +14.50s	+1.75/ 3.25s	+3.50 +1.50	13.75 17.25	
San Francisco	+19.50/ +14.50s	+1.75/ 3.25s	+3.50 +1.50	13.75 17.25	
Seattle	+19.50/ +14.50s	+1.75/ 3.25s	+3.50 +1.50	13.75 17.25	
Toronto	.....	.....	+3.50 +1.50	13.75 17.25	

	2½ & 3 in., Butt Weld◊ Galv. %	2½ & 3 in., Butt Weld◊ Black %	Mill
Atlanta	+3.50 +1.50	13.75 17.25	
Baltimore	+3.50 +1.50	13.75 17.25	
Birmingham	+3.50 +1.50	13.75 17.25	
Boston	+3.50 +1.50	13.75 17.25	
Chicago	+3.50 +1.50	13.75 17.25	
Cincinnati	+16.50	0.75	
Cleveland	+3.50 +1.50	13.75 17.25	
Dallas	+3.50 +1.50	13.75 17.25	
Denver	+3.50 +1.50	13.75 17.25	
Detroit	+3.50 +1.50	13.75 17.25	
Kansas City	+3.50 +1.50	13.75 17.25	
Los Angeles	+16.50	0.75	
Minneapolis	+3.50 +1.50	13.75 17.25	
Montreal	+3.50 +1.50	13.75 17.25	
New Orleans	+3.50 +1.50	13.75 17.25	
New York	+3.50 +1.50	13.75 17.25	
Philadelphia	+3.50 +1.50	13.75 17.25	
Pittsburgh	+3.50 +1.50	13.75 17.25	
St. Louis	+3.50 +1.50	13.75 17.25	
San Francisco	+3.50 +1.50	13.75 17.25	
Seattle	+3.50 +1.50	13.75 17.25	
Toronto	+3.50 +1.50	13.75 17.25	

	Lap Weld◊ Galv. %	Lap Weld◊ Black %	Continuous Seamless
Atlanta	+14.50s	3.25s	
Baltimore	+14.50s	3.25s	
Birmingham	+15.50s	3.25sh	
Boston	+13.50sh	3.25sh	
Chicago	+13.50sh	3.25sh	
Cincinnati	+27.50sh	9.75sh	
Cleveland	+14.50s	3.25s	
Dallas	+14.50s	3.25s	
Denver	+15.50s	3.25s	
Detroit	+13.50sh	3.25sh	
Kansas City	+14.50s	3.25s	
Los Angeles	+27.50sh	9.75sh	
Minneapolis	+14.50s	3.25s	
Montreal	+14.50s	3.25s	
New Orleans	+14.50s	3.25s	
New York	+14.50s	3.25s	
Philadelphia	+14.50s	3.25sh	
Pittsburgh	+14.50s	3.25s	
St. Louis	+14.50s	3.25s	
San Francisco	+14.50s	3.25s	
Seattle	+14.50s	3.25s	
Toronto	+14.50s	3.25s	

	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.	6 in.
Lorain, Ohio	.....	.....	.....	.....	.....	.....	.....	.....
Aliquippa, Pa	.....	.....	.....	.....	.....	.....	.....	.....
Sparrows Pt., Md.	.....	.....	.....	.....	.....	.....	.....	.....
Benwood, W. Va.	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown, O.	.....	.....	.....	.....	.....	.....	.....	.....
Indiana Harbor, Ind.	.....	.....	.....	.....	.....	.....	.....	.....
Sharon, Pa.	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75
Wheeling, W. Va.	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75
Elmo, Pa.	.....	.....	.....	.....	.....	.....	.....	.....
Fontana, Calif.	.....	.....	.....	.....	.....	.....	.....	.....

* Threaded and coupled. ◊ 3½ to 4 in. wald. ‡ to 1 & and 6 in. ◊ 6 in. § in.

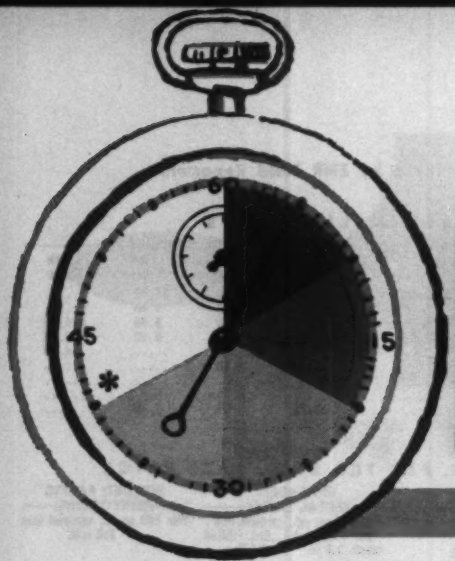
*‡ Extra quality. *‡ delivered. */ add 4% sales tax *a PRICE INDEXES or CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. For explanation of index see ENR Sept. 29, 1955 page 139. *b Extra strength. *c 4-in., $130. *d SS361-A. *f 21 in. *g culvert pipe; reinf., ASTM C 75-56. *h reinf., ASTM C 75-54. *i reinf., ASTM C 76-55. *j centrispun. *k see 2% disc. for cash. *l fob plant. *m truck del. *n LCL del., fob truck. *o less 5% disc. 10th. *p freight allowed to destination in city. *u 35,000# minimum. *r less 2% disc. 10 days. *s 1 ft lengths. *u CSA A 60. *v standard strength. *w SS: add 20% for d.s. *x fob city. *y Reinforced. *z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. *A single strength. *B truckload. *C less 2% disc. 15th. *D ASTM 76-57. *E less 1% disc. 10 days. *F less 2% disc. 30 days. *G LCL. *H CL. *I fob origin, freight allowed. *J reinf. B14-15. *K Less 2% disc. 15 days. *L ASTM 13-57. *M ASTM 200-57. *N 2 ft lengths. Truckiots. *O add 2% Sales Tax. *P 18 in. *Q less 1% disc. 10th. *R revised to show carlot instead of truckiot. *S ASTMC 72. 12" 1.55, 24" 4.00. *T Second price transite pipe.

* WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard national consumers carload prices to get mill price. List prices per ft. (based on approx. $200 per net ton): Butt Weld ⅛ in., 81½¢; ¼ in., 8¢; ⅜ in., 8¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 78½¢. Lap Weld 3½ in., 92¢; 4 in., $1.29; 5 in., $1.48; 6 in., $1.92. continuous weld same as lap weld prices. Add freight, 3% transport tax for destination price. Production discontinued November 1957

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 85.54, galv. + 95.77; 1¼ in. black, + 85.54, galv. + 95.23, 1½ in. black, + 81.78 galv. + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 95.77; 4½ in. to 8 in. black + 84.74 galv. + 90.88 Add freight rates plus 3% transportation tax to get destination price.

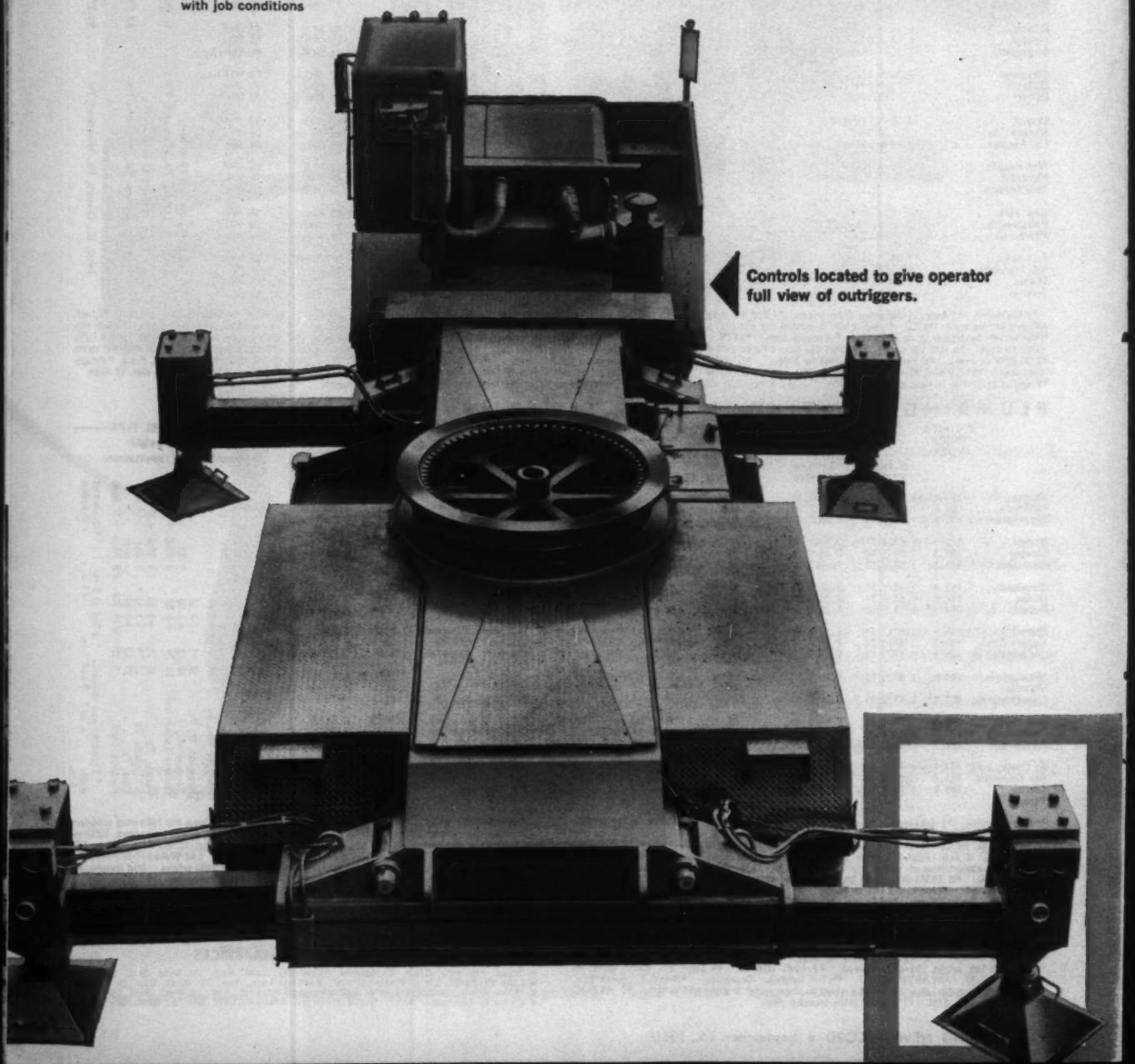
See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Aug. 18; Next, Sep. 22.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Aug. 25; Next, Sep. 29.
- Wage Rates, Building Board, Lath, Insulation: Last, Sep. 1; Next, Sep. 29.
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, Sep. 8; Next, Oct. 6.



NOW...

*Specific times vary with job conditions



Controls located to give operator full view of outriggers.

figure your truck-crane setup in seconds!

DRIVE to the job site . . . step out of the cab . . . set the hydraulic outriggers and SECONDS LATER you are ready to lift the heaviest load!

No more blocking. No more balancing and leveling to get stability . . . the new Bucyrus-Erie Hydraulic Outriggers do all the work for you and save valuable time.

What size? They're available for every Bucyrus-Erie Transit Crane built, from the mobile 11-B up to the big Bucyrus-Erie 30-B!

This is the kind of optional equipment that pays for itself in time savings alone, and adds the bonus of extra safety on every heavy lifting assignment!

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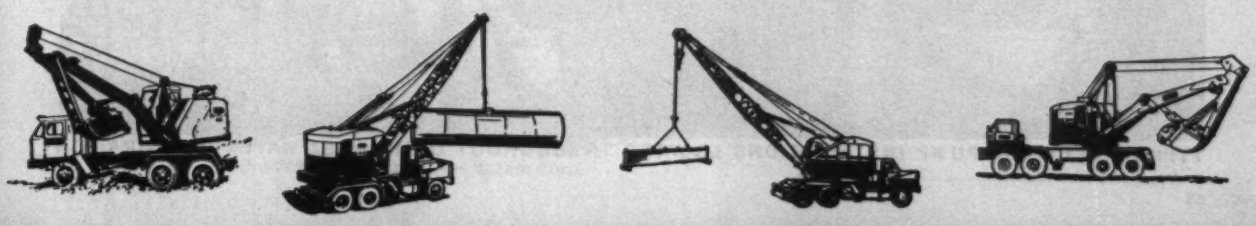

HERE'S HOW TO MOVE 18 MILLION GALLONS OF WATER EVERY DAY

In virtually constant use, Peerless pumps insure dependable water flow to utility's 18,000 customers . . .

The Dominguez Water Corporation has a colorful history that dates back to the early Spanish land grants in California. It was first formed in 1911 and its initial patrons were farmers of land which formed a part of the historically famous Rancho San Pedro.

Today this privately owned public utility serves over 17,000 residences and 1,000 agricultural and industrial customers. Its service area comprises a 35 square mile section in the southern part of Los Angeles County.

Throughout the system, this immaculate-looking facility makes virtually constant use of Peerless pumps. Practically all of the water they distribute is pumped by Peerless. From tiny 2 hp Fluidyne pumps and large Type A booster units to mammoth deep well turbines, these sturdy pumps keep water moving in a steady flow. Many of the pumps have seen 25 years or more of continuous service. And downtime for repairs is practically nonexistent, reports operation personnel.

Years of performance. Lowest possible maintenance attention. Best service. These are typical qualities you can expect and get in a Peerless pump. Get the facts on this fine complete line of pumps now. Write today for a catalog and the name of the Peerless representative in your area.

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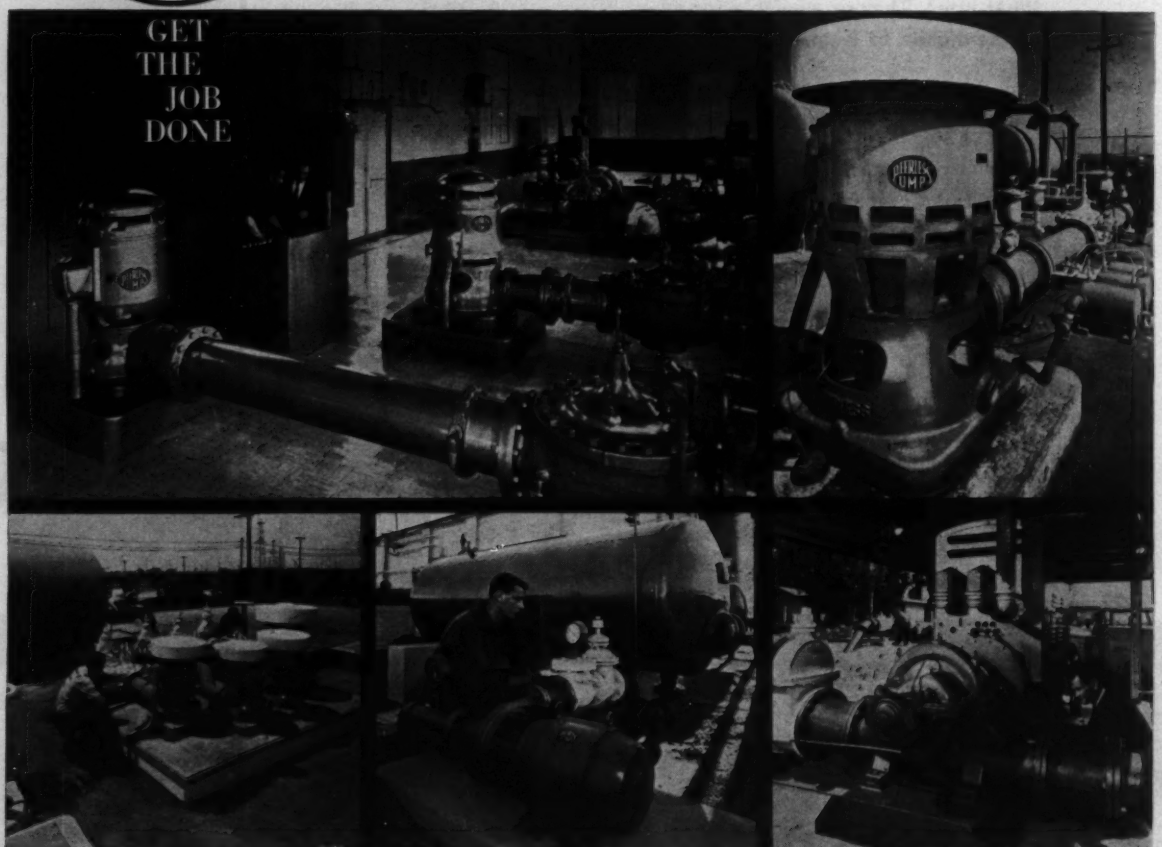

TYPICAL PEERLESS PUMP INSTALLATIONS LOCATED THROUGHOUT DOMINGUEZ WATER CORPORATION

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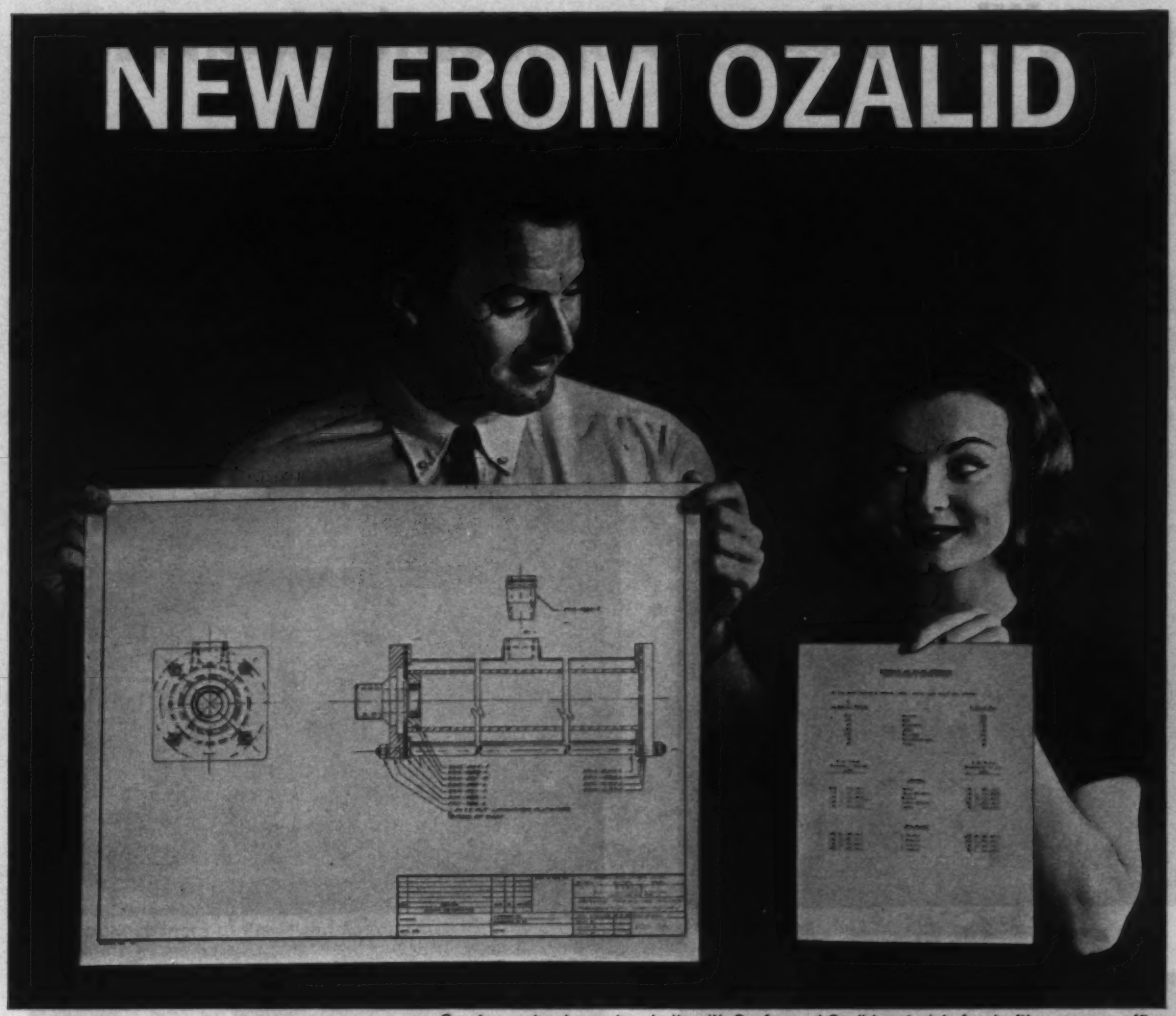

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What other culvert material has all the

LONG SERVICE LIFE. Drainage pipe made of Beth-Cu-Loy steel sheets often outlives the original need. It can then be lifted out and placed in a new location for additional years of service. The copper content of the steel base, along with a heavy zinc coating, give Beth-Cu-Loy sheets a very high resistance to corrosion.

MEETS AASHO SPECS. Beth-Cu-Loy culvert sheets conform in every way to AASHO standards. Bethlehem furnishes a sheet manufacturer's certified analysis and guarantee, which includes the average chemical composition by ladle analysis.

EASY TO INSTALL. Light enough to be laid without special equipment. Long pipe lengths reduce the number of field joints, speed up laying.

FIELD JOINTS IN MINUTES. No sealing compound needed, no mortar to set. Just a connecting band of Beth-Cu-Loy secured around the joint with a few turns of a wrench on the bolts . . . it's no more complicated than that.

Steel

For strength
. . . economy
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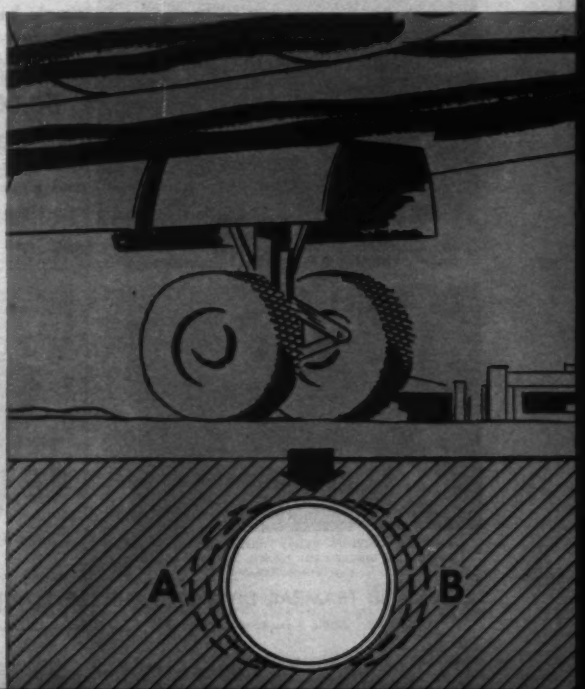
advantages of corrugated Beth-Cu-Loy sheets?

SIMPLIFIES GRADE AND ALIGNMENT. Because it is made of steel, a Beth-Cu-Loy drainage structure is highly resistant to fracture, needs no feather bed. Flexible enough to conform to slight changes in grade and alignment.

LESS COSTLY TO SHIP. Corrugated steel drainage pipe weighs a lot less per running foot, thus lowers shipping charges. Here, more than a quarter of a mile of Beth-Cu-Loy is handled on one truck trailer.

FLEXES WITH FILL. Pipe made of corrugated Beth-Cu-Loy steel is flexible transversely as well as longitudinally, thus can enlist the aid of surrounding material to support imposed loads. The drawing shows how a vertical load produces pressure against fill at points A and B, setting up counter-loads which largely offset the forces through the vertical axis.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
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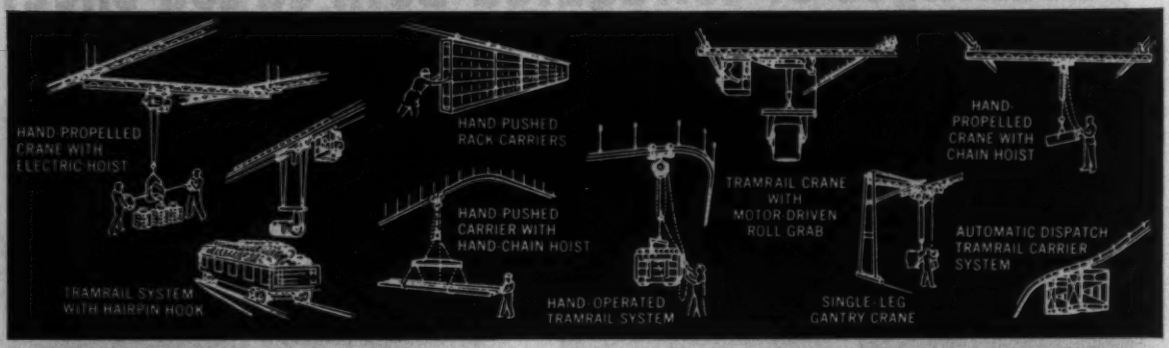
BETHLEHEM STEEL

BETHLEHEM STEEL

CLEVELAND TRAMRAIL *Serves* EVERY INDUSTRY

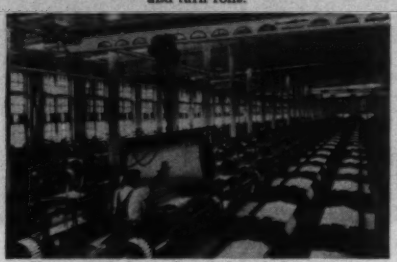

HAND-PROPELLED CRANE WITH ELECTRIC HOIST
HAND-PUSHED RACK CARRIERS
HAND-PROPELLED CRANE WITH CHAIN HOIST
TRAMRAIL CRANE WITH MOTOR-DRIVEN ROLL GRAB
HAND-PUSHED CARRIER WITH HAND-CHAIN HOIST
AUTOMATIC DISPATCH TRAMRAIL CARRIER SYSTEM
TRAMRAIL SYSTEM WITH HAIRPIN HOOK
HAND-OPERATED TRAMRAIL SYSTEM
SINGLE-LEG GANTRY CRANE

150-foot long cab-operated cranes operate on 8-track runways. Power-operated grabs handle and turn rolls.

TRIED AND PROVEN COST-CUTTING EQUIPMENT

The variety of ways in which Cleveland Tramrail is serving industry is amazing. It delivers materials from storage or car or truck, directly to point of work without re-handling—transports delicate, fragile wares without damage—moves hot molten metals safely—carries materials between distant points on the same or different floors or buildings. It speeds production, improves plant efficiency and cuts costs. Regardless of size or type, most installations pay for themselves in one year and keep on paying goodly dividends years after year thereafter.

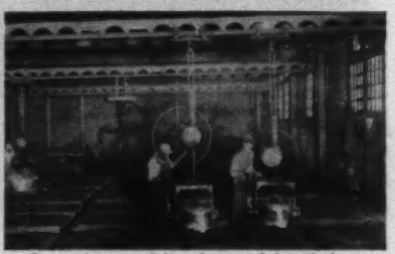
Cab-operated tractor hauls brick mixes at low cost in bottom-dump buckets from mixers to press hoppers.



Heavy textile beams handled easily by one man with hand-propelled crane. No floor interference. Closer loom spacing.

STANDARD ITEMS EASILY COMBINED TO HANDLE MATERIALS OF ANY KIND

Cleveland Tramrail consists of track, switches, carriers, cranes, hoists, grabs, etc., which can be combined in a thousandfold ways to serve nearly every need. Equipment can be made in all variations from simple hand or electric floor-operated, to cab-controlled and automatic plant-wide systems.



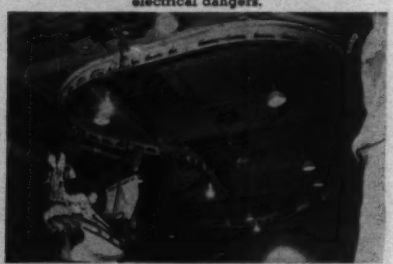
Tramrail cranes deliver hot metal directly from furnaces to molds in fastest time. Speed production. Aid safety.

Heavy batteries are easily handled with manually-propelled cranes and electric hoists. SAFPOWRBAR® ELECTRIFICATION minimizes electrical dangers.

50,000 INSTALLATIONS

Over 10,000 customers have purchased 50,000 installations of Cleveland Tramrail and many of these are still in continuous operation after 25 or more years of service.

Heavy castings machined on planer are carefully inched into place with smooth working Tramrail crane.



Tramrail carriers safely carry thousands of people in amusement parks. Special controls prevent collisions.

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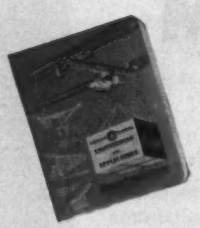

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 3151 E. 284 ST. • WICKLIFFE, OHIO

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Conn., Hartford**—HIGH SCHOOL—BA 9/20—Bd. Educ., 249 High Sch., Hartford, limestone, brick high school, $6,750,000. Plans deposit $150. Malmfeldt & Assocs., 36 Pearl St., archts. A. John Macchi, 44 Gillette St., engr. CD 8/12/58.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Suburban Excavators, Inc., 4 New Salem St., Wakefield, Mass., CA $1,140,574, constr. section Interstate Hy. 495.1-495-6(19)73, Andover-Tewksbury. Bids June 28, awarded Aug. 30. CD 6/30, under LB.

BUILDINGS—LB & CA

▲ **M. J. Walsh & Son, Inc.**, 14 Shawmut Ave., Holyoke, Mass., LB $1,084,400 Base Bid, INTERMEDIATE SCHOOL, SOUTH HADLEY, MASS. Town, School Dpt. Office, 38 Carew St., South Hadley, Mass. Bids Sept. 1. CD 8/5.

▲ **George A. Fuller Co.**, 60 Sigourney St., Hartford, Conn., CA $3,500,000, 130,000 sq. ft. air-conditioned brick HOME OFFICE EAST WING Addn., 151 Farmington Ave., HARTFORD, CONN. Aetna Life Insurance Co., 151 Farmington Ave., Hartford, Conn. CD 11/20.

▲ **Richard Shlomberg**, 18 Raymond Rd., West Hartford, Conn., Owner Builds, $1,149,500, 50 HOUSES, "Fairlane Homes," Grimes Rd., WETHERSFIELD, CONN.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Mohegan Lake**—SCHOOLS—BA 9/29—Bd. Educ. Central School Dist. No. 1, Towns of Yorktown, Somers and Cortland, Westchester Co. and Putnam Valley, Carmel and Phillipstown, Putnam Co., Lakeland High School, U. S. Rte. 6, Mohegan Lake, general contract, incl. landscaping, plumbing, heating and ventilating and electric, Washington School, Mohegan Lake and Jefferson School, Jefferson Valley, both Westchester Co. Plans deposit $60. Reginald E. Marsh & Assocs., 101 Park Ave., New York, Zone 17, archts. CD 7/12.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Bridge Auth., Bridge Plaza, Poughkeepsie, Bids opened 8/31,
Dravo Corp., 19 Rector St., New York 6, N. Y., and **Frederick Snare Corp.**, 233 Broadway, New York 7, N. Y., LB $3,981,060 (4 bidders), substructure control, Newburgh-Beacon Bridge, Orange and Dutchess Counties. CD 8/16.

▲ **Woodcrest Constr. Co., Inc.**, 369 Lexington Ave., New York 17, N. Y., LB $1,201,349, (4 bidders) station platform extensions of Lexington Ave., Fourth Ave. Line, IRT Div., Group XVII-51, 68, 77, 96, 103, 110 and 116 Sts., Contr. C-140, Manhattan Boro, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Sept. 2. CD 8/3.

BUILDINGS—LB & CA

▲ **Comet Constr. Corp.**, 10-37 47 Rd., Long Island City, N. Y., LB $1,359,000, general contract JUNIOR-SENIOR HIGH SCHOOL, FIELD HOUSE and site development, COLD SPRINGS, N. Y. Bd. Educ. Central School Dist. No. 2, Towns of Huntington and Oyster Bay, Main St., Cold Spring, N. Y. Sherwood, Mills & Smith, 65 Broad St., Stamford, Conn., archts. Bids Aug. 25. CD 8/25, under LB.

▲ **Jos. Bisceglia & Sons**, 13 Oakland Ave., Harrison, N. Y., LB $3,093,737, general contract Alfred G. Berner JUNIOR-SENIOR HIGH SCHOOL, MASSAPEQUA, N. Y. Bd. Educ. Union Free School Dist. 23, Massapequa, N. Y. Bids Aug. 29. CD 8/5.
Baymar Contg. Corp., 31-15 14 St., Long Island City, N. Y., LB $479,000, heating and ventilating Alfred G. Berner Junior-Senior High School (Massapequa, N. Y.).
Peters & Peters, Inc., 58-11 32 Ave., Woodside, N. Y., LB $546,951, electrical work for Alfred G. Berner Junior-Senior High School (Massapequa, N. Y.).

▲ **Kaslow & Jeffrey Constr. Co.**, 495 Main St., Chatham, N. J., Owner Builds, $2,500,000, 132 unit APARTMENT, Morris Turnpike, SHORT HILLS, N. J. Wm. Chigotis, 80 Morris Ave., Springfield, N. J., archt.

▲† **Rand Constr. Co.**, 386 Park Ave., New York, N. Y., LB $2,184,500, ELEMENTARY SCHOOLS, McGuire Air Force Base, WRIGHTSTOWN, N. J. U. S. Housing & Home Finance Agency, Juniper and Chestnut St., Phila., Pa. Bids Aug. 16. CD 8/12.

▲ **Barode Corp.**, 1609 E. Wadsworth Ave., Phila., Pa., Separate Contracts, $2,875,000, RESIDENTIAL DEVELOPMENT, (225), Fitzwatertown Rd., etc., AMBLER, PA.

▲ **Kent Homes, Inc.**, 6484 Ardleigh St., Phila., Pa., Separate Contracts, $1,300,000, RESIDENTIAL DEVELOPMENT (65), Concord Square, CHESTER, PA.

▲ **Heritage, Inc., Att Fred W. Zink**, 165 Town Center Rd., King of Prussia, Pa., Separate Contracts, $2,500,000, 336 unit APARTMENT DEVELOPMENT, Garden type, PLYMOUTH MEETING, PA.

▲† **Piracci Constr. Co., Inc.**, 2552 Woodbrook Ave., Baltimore, Md., CA $3,989,000 Base Bid, OLD AGE and SURVIVORS INSURANCE ANNEX, BALTIMORE, MD. General Services Admin., Rm. 7122, Regional Office Bldg., 7 and D Sts. S.W., Wash. 25, D. C. Bids Aug. 3. CD 8/5, under LB.

▲ **E. I. duPont deNemours & Co., Inc.**, duPont and Nemours Bldg., Wilmington, Del., Owner Builds, $2,000,000, Biochemicals Lab, Center Rd., WILMINGTON, DEL.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **Ruscon Constr. Co.**, 149 Bay St., Charleston, S. C., LB $1,138,000, (3 bidders), reconstruction Union Pier, CHARLESTON, S. C. S. C. State Ports Authority, foot of Market St., Charleston, S. C. Bids Aug. 5. CD 8/22.

▲ **ALABAMA**—State Hy. Dpt., Montgomery Zone 4, Bids opened 8/26,
Ala.—W. S. Fowler Rental Equipment Co., Oneonta, Ala., LB $975,805, grading, blt. and bridges 4.659 mi. Ala. 9 (Prop. A) Cherokee Co.; LB $361,237, grading, blt. and bridges 2.5 mi. Ala. 9 (Prop. C) Cherokee Co.;
Ala.—Ashburn & Gray, Inc., Box 58 S Memorial Parkway, Huntsville, Ala., LB $1,219,337, grading, blt. 11.009 mi. U. S. 231, Madison Co.;
Ala.—W. T. Ratliff Co., Candoro, Knoxville, Tenn. LB $1,793,141, grading, blt. 9.397 mi. U. S. 43, Mobile Co.;
Ala.—R. B. Tyler Co., 1446 Levering, Louisville, Ky., LB $504,379, base, blt. 9.437 mi. U. S. 78, Walker Co.;
Ala.—Sam Finley, Inc., 292 NORTH AVE Atlanta and Hardaway Contr. Co., Columbus, Ga., LB $1,165,383 blt. pave., and bridges U. S. 431 and Ala. 30 (Prop. A) Barbour Co. CD 8/2.

▲ **TENNESSEE**—State Hy. Dpt., Nashville.
Tenn.—J. B. Michael & Co., 1021 Hayward St., Tenn., CA $2,880,429, grading construction of 16 bridges, Rte. 75, 4.620 mi., Proj. No. I-75-1(9)3, Hamilton Co.,
Tenn.—J. A. Hadley Constr. Co., Humboldt., Tenn., CA $537,011, grading, construction of 6 bridges, Rte. 14, Proj. No. F-014-2(16), Tipton Co.;
Tenn.—A. B. Long, Inc., 3165 Central St., N. Harrisman, Knoxville, Tenn., CA $929,086, (12 bidders), grading construction, of 7 bridges, Rte. 61, 6.303 mi., Proj No. F-031-1(8), Roane and Morgan Counties. Grand total $4,346,526. Bids Aug. 26. CD 9/6.

BUILDINGS—LB & CA

▲ **Daniel Constr. Co.**, 429 N. Main St., Greenville, S. C., CA Est. $3,000,000, incl. equipment, 160,000 sq. ft., fiber glass mfg. PLANT, ANDERSON, S. C. Clark-Schwebel Fiber Glass Corp., c/o contractor.

▲ **Traylor Bros. Inc.**, Station B, Box 66, Evansville, Ind. CA Est. $1,500,000, SHOPPING CENTER, FRANKFORT, KY. Traylor Bros. Shopping Center Developers, Station B, Box 66, Evansville, Ind.

▲ **W. A. Stragand & L. H. Case**, 5706 Crestview Drive, Chattanooga, Tenn., Day Labor, $1,500,000, 100 RESIDENCES, near Highland Plaza Shopping Center, CHATTANOOGA, TENN.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **O., Cleveland**—PIER EXTENSION—BA 9/22—City, Dpt. Port Control, City Hall, Zone 14, extension W. 3 St. Pier. $2,000,000. Plans deposit $75. Osborne Engineering Co., 7016 Euclid Ave., Cleveland 3, O., engr. CD 11/10/55.

BUILDINGS—BA

▲ **Ill., Galesburg**—FACTORY—BA 9/26—Gates Rubber Co., 999 S. Broadway Ave., Denver, Colo., rubber factory, Hy. 150. $3,500,000. CD 3/24.

▲ **Ill., Chicago**—HOUSING—BA 9/27—Chicago Housing Auth., 608 S. Dearborn St., Zone 5, Ill. 237, Stage 3, Robert R. Taylor Homes to incl. 1,262 units, community center, central heating plant, etc. $18,000,000. Shaw, Metz & Assocs., 208 S. La Salle St., Chicago 4, Ill., archts. CD 3/17/59.

▲ **O., Toledo**—SCHOOL—BA 9/30—Bd. Educ., Manhattan and Elm Sts., South High School, $3,700,000. Plans deposit $35. Sanborn, Stekete & Assocs., Otis and Evans, 1214 Cherry St., archts. CD 11/18.

▲ **Ill., Chicago**—SCHOOLS—BA 10/10—Bd. Educ., 228 N. LaSalle St., Arnold Upper Grade and Waller High Schools. $1,200,000. Stanley Anderson & Assocs., 270 E. Deerpath Rd., Lake Forest, archts. CD 4/24/59 and 2/2/59.

▲† **Ill., Marion**—FEDERAL MAXIMUM SECURITY PENITENTIARY—BA 10/18—General Services Admin., P. Bldgs. Service, Wash. 25, D. C., concrete fdns., concrete and structural steel framing, precast and prestressed concrete work, etc. maximum security penitentiary, administration bldg., boiler house, garage and fire station, chapel, hospital, warehouse, library, cell bldgs., towers and officer's shelters, etc. CD 2/19/59.

HEAVY CONSTRUCTION—LB & CA

▲ **City**, City Hall, Warren, O., rejected bids opened Aug. 1, Contracts B and C, Red Run Interceptor and Mahoning Diversion Sewers, WARREN, O. LB $4,892,985. CD 8/8, under LB.

BUILDINGS—LB & CA

▲ **Sherman Olson, Inc.**, 219 N. Kilpatrick Ave., Chicago 44, Ill., CA $6,000,000, remodeling OFFICE, CHICAGO, ILL. Riverside Plaza Corp., c/o O. S. Turner Co., 201 N. Wells St., Chicago 6, Ill. Graham Anderson Probst & White, 201 N. Wells St., Chicago 6, Ill., archts. Awarded Aug. 26.

▲ **Power Constr. Co.**, 125 S. Marion St., Oak Park, Ill., CA $1,542,048, est. $1,500,000, East HIGH SCHOOL, Cary, CRYSTAL LAKE, ILL. Community High School Dist. 155, 25 W. Franklin St., Crystal Lake, Ill. Bids Aug. 4, awarded Aug. 26. CD 8/24, under LB

▲ **Krilich Builders**, 5906 Milwaukee Ave., Chicago, Ill., CA $6,000,000, SHOPPING CENTER, NILES, ILL. Lawrencewood Shopping Centre, corner Oakton and Milwaukee Aves., Niles, Ill. Fisher & Shaffer, 874 N. Wabash St., Chicago 11, Ill., archts.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ **Minn., Wayzata**—SCHOOL—BA 9/22—Bd. Educ. Independent School Dist. No. 284, Senior High School. $1,200,000. Plans deposit $30. Extended date. Patch & Erickson, 2815 Wayzata Blvd., Minneapolis, archts. CD 8/24.

▲ **Minn., Mankato**—PHYSICAL EDUCATION—BA 10/6—State Dpt. Admin., 19 State Capitol, St. Paul, physical education, Mankato State College. $1,957,458. Plans deposit $50. Graffunder-Nagle & Assocs., 688 Sexton Bldg., Minneapolis, archts. CD 10/22.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported n low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

BUILDINGS—SLC

▲ **Minn., Golden Valley (P. O. Minneapolis)**—AERO ENGINEERING PLANT, etc.—Minneapolis-Honeywell Regulator Co., 2753 4 St., Minneapolis, soon lets contract, 197x615x674 ft. L-shape aero engineering plant office addn., 2600 Ridgeway Rd. $1,500,000. Ellerbe & Co., 333 Sibley St., St. Paul, archts.

▲ **Mo., St. Louis County**—PLANT—International Paper Co., Container Div., Parsipany Rd., Whippany, N. J., soon lets contract 1 story, 300x300 ft., masonry, precast and prestressed concrete panels, steel, etc. sheet plant, Hy. 66 By-Pass and Larrimore Rd. E. George Cassis, Litchfield, Ill., engr. William Tao, 3608 S. Grand Blvd., St. Louis 18, Mo., mechanical and electrical engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **SOUTH DAKOTA**—State Dpt. Hys., Pierre,

S. D.—**J. H. Beckman Constr. Co.**, 3631 W. 14 St., Sioux Falls, S. D., CA **$1,970,390**, grading, surf. 3.787 mi. I-229, Proj. I 229-2(7)82. Minnehaha Co.;

S. D.—**H. G. Seeley Constr. Corp.**, DeSmet, S. D., CA **$697,222**, grading 10.002 mi. I-29, Proj. I 29-2 (5)47 and I 29-1(8)45, Lincoln and Union Counties;

S. D.—**Johnson Bros.**, 342 S. Harrison St., Pierre, S. D., CA **$539,077**, grading, subbase 15.023 mi. S.D. 24 and 73, Proj. F 028-2(3), Haakon Co. Grand total $3,206,689. Bids Aug. 11. CD 8/18, under LB.

▲ **R. H. Fulton & Co.**, Box 1526, Lubbock, Tex., CA **$1,500,000**, 30 mi. 30 in., Permian-San Juan Crossover loop gas line, Midland, Texas. El Paso Natural Gas Co., El Paso Nat. Gas. Bldg., El Paso, Tex. CD 6/20.

BUILDINGS—LB & CA

▲ **Nagle-Leck, Inc.**, Baker Bldg., Minneapolis, Minn., CA **$5,000,000**, 5 story and 8 story, 266,000 sq. ft. top OFFICE addn., and 1 story Penthouse, MINNEAPOLIS, MINN. Pillsbury Co., 608 Second Ave. S., Minneapolis, Minn. E. F. Baker, 600 Mobile Oil Bldg., Minneapolis, Minn., archt. D. J. Griswold & Assoc., 1409 Willow St., Minneapolis, Minn., archts. for 5 story of project. Johnston & Stahlman, 640 Sexton Bldg., Minneapolis, Minn., structural engrs.

▲ **Jones-Kissner Constr. Co.**, 706 Chestnut St., St. Louis 1, Mo., CA **$1,127,710**, est. $1,075,000 (8 bidders), JUNIOR HIGH SCHOOL, Hy. 67 and Northumberland Dr., RIVERVIEW GARDENS (ST. LOUIS 37 P.O.), MO. School Dist. of Riverview Gardens, 1370 Northumberland Dr., St. Louis 37, Mo. Bids Aug. 30, awarded Sept. 1. CD 8/8.

▲ **Richard J. O'Brien Constr. Co.**, New Halls Ferry Rd., St. Louis, 36, Mo. Owner Builds, **$2,000,000**. 125 RESIDENCES, Sect. 11 of Marietta subdivision, New Halls Ferry Rd., 1 mi. N. of Hy. 140, ST. LOUIS COUNTY, MO.

▲ **Rex Builders**, St. Peters, Mo., Owner Builds, **$1,250,000**, 225 RESIDENCES St. Peters Estates Subdivision west of Mark Twain Hy. No. 70, Church Steeple Lane, ST. PETERS, Mo.

▲ **J. W. Cooper Constr. Co., Inc.**, Box 3947, Odessa, Tex. CA **$1,500,725**, general contract, Jas. Madison JUNIOR HIGH SCHOOL, Barrow and Bennett Sts., and Horace Mann High School, Vogel and Mimosa Sts., ABILENE, TEX. Abilene Ind. School Dist., Abilene, Tex. Bids Aug. 31. CD 8/23.
Webb Plb. & Htg. Co., 141 Oak St., Abilene, Tex., CA **$480,540**, mechanical contract for 2 high schools (Abilene, Tex).

▲ **Procon, Inc.**, 1111 Mount Prospect Rd., Des Plaines, Ill., CA approx. **$2,615,000**, HYDEAL REFINERY UNIT, for converting toluene into benzine, Houston Ship channel, HOUSTON, TEX. Signal Oil & Gas Co., San Jacinto Bld., Houston, Tex. Bids Aug. 16. CD 8/22;
Brown & Root, Inc. P. O. Box 3, Houston, Tex., CA Approx. **$1,435,000**, CATALYTIC CRACKING REFINERY UNIT, Houston Ship channel, (Houston, Tex.).

▲ **Spaw-Glass, Inc.**, Box 25025, Houston, Tex., LB **$1,873,000**, (8 bidders), general contract JUNIOR HIGH SCHOOL, San Felipe Rd. and Bering Dr., HOUSTON, TEX. Houston Ind. School Dist., 1300 Capitol Ave., Houston, Tex. CD 8/16.

▲ **Western Investment Corp.**, 7728 Long Point Rd., Houston, Tex., Owner Builds, **$1,428,000**, 100 DWELLINGS, Western Estates, HOUSTON, TEX.

FAR WEST

BUILDINGS—BA

▲ **Calif., Garden Grove**—SCHOOL—BA 9/26—Garden Grove High School Dist., 11271 Sanford St., Santiago High School. $2,600,000. CD 5/16.

▲ **Calif., Anaheim**—SCHOOL—BA 9/30—Anaheim Union High School Dist., 123 North Citron Ave., Crescent Junior High School. $1,134,000. CD 4/6/59.

▲ **Wash., Tacoma**—HOSPITAL—BA 10/4—Tacoma General Hospital, 315 S. K St., 4 story, 80,000 sq. ft. hospital addn. incl. steam heating plant. $2,000,000. Plans deposit $100. Lea, Pearson & Richards, 249 S. Stadium Way, archts. CD 12/15/58.

▲ **Wash., Seattle**—CEMENT TERMINAL—BA 10/5—Ideal Cement Co., Denver National Bldg., Denver, Colo., cement terminal to incl. wharf, dredging and nine silos, 145 ft. high. $2,000,000. CD 4/20.

HEAVY CONSTRUCTION—LB & CA

▲† **Carl N. Swenson Co., Inc.**, 1095 Stockton St., San Jose, Calif., LB **$1,225,000** (7 bidders), 2 story, bsmnt., rein.-con. walls, floors and roofs Data Reduction Center, Spec. A-2600, MOFFETT FIELD, CALIF. National Aeronautics & Space Admin., Ames Research Center, Procurement Office, Moffett Field, Calif. Bids Aug. 16. CD 7/29.

BUILDINGS—LB & CA

▲ **Construction & Engineering Co.**, 127 Beacon St., South San Francisco, Calif., CA Est. **$3,000,000**, 280,000 sq. ft. INDUSTRIAL PLANT, Crocker Industrial Park, near BRISBANE, CALIF. Dohrmann Commercial Co., Dohrmann Hotel Supply Co. & Crocker Land Co., 984 Mission St., San Francisco, Calif.

▲† **Noxon Constr. Co.**, 1513 W. Temple St., Los Angeles, Calif., LB **$2,209,950** (2 bidders), 140 units Capehart HOUSING, ENB 04-203-61-30, CAMP IRWIN, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Benedict Beckler & Assocs., 3501 Cahuenga Blvd., Los Angeles, Calif., archts. CD 8/1.

▲ **M & K Corp.**, 519 Callfornia St., San Francisco, Calif., CA **$4,355,000** (12 bidders), installation of CRUSHERS, RAW and CLINKER STORAGE, MILL BLDGS., KILN, etc., REDDING, CALIF. Calavaras Cement Co., 315 Montgomery St., San Francisco, Calif. Bids Aug. 18. Bids for Administration Bldg. were rejected. Will re-advertise. CD 7/28.
Homan & Lawrence Engineering Co., 1295 Folsom St., San Francisco, Calif., CA **$1,585,000**, RAW STORAGE SILOS, CEMENT STORAGE SILOS and PACK HOUSE (Redding, Calif.).

CANADA

BUILDINGS—LB & CA

▲ **Taylor-Woodrow (Canada) Ltd.**, 42 Charles St. E., Toronto, Ont., CA Est. **$20,000,000**, SHOPPING CENTER and OFFICE, King, Main and Catharine Sts., HAMILTON, ONT. Terminal Towers (Hamilton) Ltd., c/o Lowe & Hoyt, 36 James St. S., Hamilton, Ont. Crang & Boake, 79 Huntley St., Toronto, Ont., archts. CD 7/11.

LATIN AMERICA

BUILDINGS—LB & CA

▲ **Shell International Petroleum Co.**, 50 W. 50 St., New York 19, N. Y., U.S.A., Owner Builds, **$9,800,000**, OIL REFINERY, ACAJUTLA, EL SALVADOR.

AMERICANS ABROAD

BUILDINGS—LB & CA

▲ **Societe Franco-Americane de Constructions, Atomiques (Framatome)**, 12 Rue Lincoln, Paris, France and **Ateliers de Constructions Electriques de Charlevoi**

(Continued on page 76)

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MODEL VPG 1500 VIBRO PLATE, 1700 lbs. impact -- 5,000 per min., 19"x24" effective area of compaction, wt. only 135 lbs. Ideal for compacting sand and gravel. Built-in water sprinkling system for hot or cold mix asphalt patching.

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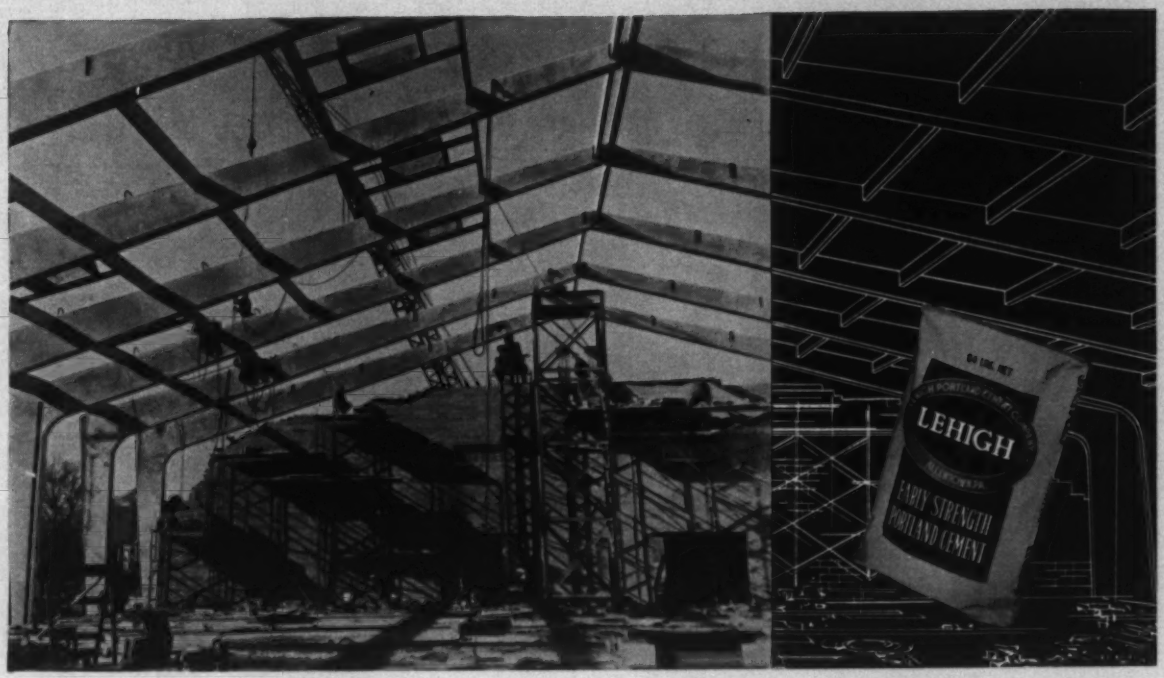


Jordan Sellars High School Gymnasium, Burlington, N. C. Unobstructed floor area is 100′ by 120′. Height at center of arch is 32′.

Architect: McMinn, Norfleet & Wicker, Greensboro, N. C.

Contractor: O. G. Thompson & Sons, Burlington, N. C.

Manufacturer Precast Units: Arnold Stone Company, Greensboro, N. C.

Ready Mixed Concrete: R. F. Kirkpatrick & Sons, Burlington, N. C.

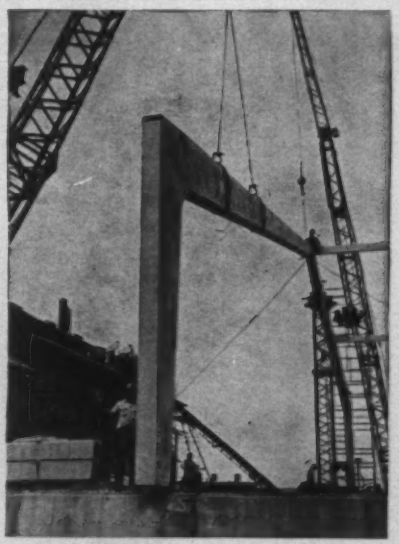
8 PRECAST CONCRETE ARCHES FRAME 100′ WIDE GYM

Lehigh Early Strength Cement Cuts Casting Time

Attractiveness, durability, fire safety and unusual simplicity—all characterize the frame of this new gym and further prove the versatility of precast concrete. The huge arches were cast on the gym floor in half sections and raised into position. Precast concrete purlins, spanning 16 feet between arches, provide lateral stability.

For fast re-use of forms in casting both arches and purlins, Arnold Stone Company used concrete made with Lehigh Early Strength Cement. To quote Mr. M. A. Arnold, "Lehigh Early Strength Cement enabled us to complete the casting operations in half the time required with regular portland cement."

This is a typical advantage of Lehigh Early Strength Cement in modern concrete construction. Lehigh Portland Cement Company, Allentown, Pa.



As one crane raised and held the 18-ton arch half, another (on the right) guided it into position. The two halves were then welded together to form complete arch.

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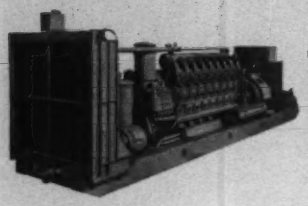

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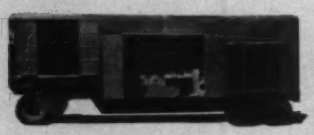

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(Continued from page 74)

(ACEC), Rue Vital Francoisse, Marcinelle, Belgium, CA NUCLEAR POWER PLANT, Meuse River, CHOOZ, FRANCE. Societe d'Energie Nucleaire, Franco-Belge des Ardennes (Sena). Gibbs & Hill, 461 8 Ave., New York 1, N. Y., U. S. A., engrs.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Alaska., Anchorage**—City, City Hall, $1,500,000 bond election Oct. 4, water main extensions in Spenard Public Utility Dist. and other extensions. CD 12/17/51.

▲† **D. C., Wash.**—D. C. Govt., Dpt. Sanitary Eng., 499 Pennsylvania Ave. N.W., water main: S.E. relief low service relief main, 6th and Eye Sts. N.E. and Pennsylvania Ave. and Kentucky Ave. S.E. (1st section: Eye St. N.E. between 6th and 8th Sts., 66-in. diam. water main). $1,500,000. $500,000 appropriated.

▲ **N. C., Winston-Salem**—City, City Hall, $6,000,000 bond election Sept. 27, water filter plant, treated storage, reservoir, lines, raw water reservoir. CD 3/17.

▲ **Tex., Houston**—City, City Hall, 84 in. water line, under ship channel (upper part of channel), $4,000,000; 48 in. water line, under ship channel, (lower part of channel), $2,000,000. Brown & Root, Engineers, 35 Japhet St., consult. engrs. CD 5/17.

SEWERS, WASTE DISPOSAL

▲ **Pa. Media**—Bd. Comrs. Delaware Co., Media, Refuse Incinerator Plant No. 3. $2,000,000. CD 2/29/57.

▲ **Pa., Trevose**—Lower Southampton Township, Bucks County, Municipal Authority, sewerage collection system, Trevose Heights, Poquessing Heights, Feasterville. $4,200,000. Gannett Fleming Corddry & Carpenter, Inc., 600 N. 2, Harrisburg, consult. engr. CD 8/23.

BRIDGES

▲ **Wash., Seattle**—City, County-City Bldg., extending imprv., W. Spokane viaduct, incl. interchanges, $3,800,000. B. V. Christy & Assocs., 3201 Fremont Ave., consult. engrs. R. W. Morse, city engr. Bids early 1961. CD 3/16/60.

▲ **Ontario and New York**—Niagara Falls Bridge Comn., 1781 River Rd., Niagara Falls, Ont., bridge connecting Queenston, Ont., and Lewiston, N. Y., U.S.A. $12,000,000. Hardesty & Hanover, 101 Park Ave., New York 17, N. Y., consult. engrs. CD 7/18.

▲ **Que., Sherbrooke**—City, City Hall, bridge over St. Francois River, Montreal and Terrill Sts. $3,000,000. Cote, Lemieux, Carignan & Bourque, 144 Vimy St. N., consult. engrs.

EARTHWORK, WATERWAYS

▲ **Alberta**—Prairie Farm Rehabilitation Admin., Motherwell Bldg., Regina, Sask., irrigation dam, Hillspring. $7,000,000. CD 5/9/45.

AIRPORTS

▲† **Fla., Homestead**—PAVING, etc.—U. S. Eng., 575 Riverside Ave., Jacksonville, paving, lighting, jet blast deflector, SAC Air Launch Missile Facility, Homestead Air Force Base, $4,900,000, funds released.

▲ **Pa., Phila.**—BAGGAGE CLAIM BLDG.—Dpt. Procurement, City Hall Annex, plans by Abraham Levy, 1420 Walnut St., baggage claim bldg., loading pier and paving, Bids 6641 to 6645, Phila. International Airport $2,835,128. David Bloom, 225 S 15th. St., consult. engr. CD 5/7/59.

UNCLASSIFIED

▲ **Alaska, Anchorage**—TELEPHONE FACILITIES—City, City Hall, $1,500,000 bond election Oct. 4, expansion city telephone facilities. CD 1/4/56.

▲ **Mass., New Bedford**—FISH PIER—City, City Hall, plans by Alonzo B. Reed, Inc., 141 Milk St., Boston, fish pier, $3,000,000. Constr. 1961.

▲ **North Dakota**—PIPE LINES—Great Northern Pipe Line Co., sub. Great Northern Railway, 175 E. 4th St., St. Paul 1, Minn., 2nd Section, 64 mi. crude oil pipe line to lignite field in Burke Co. $1,600,000. Constr. 1961.

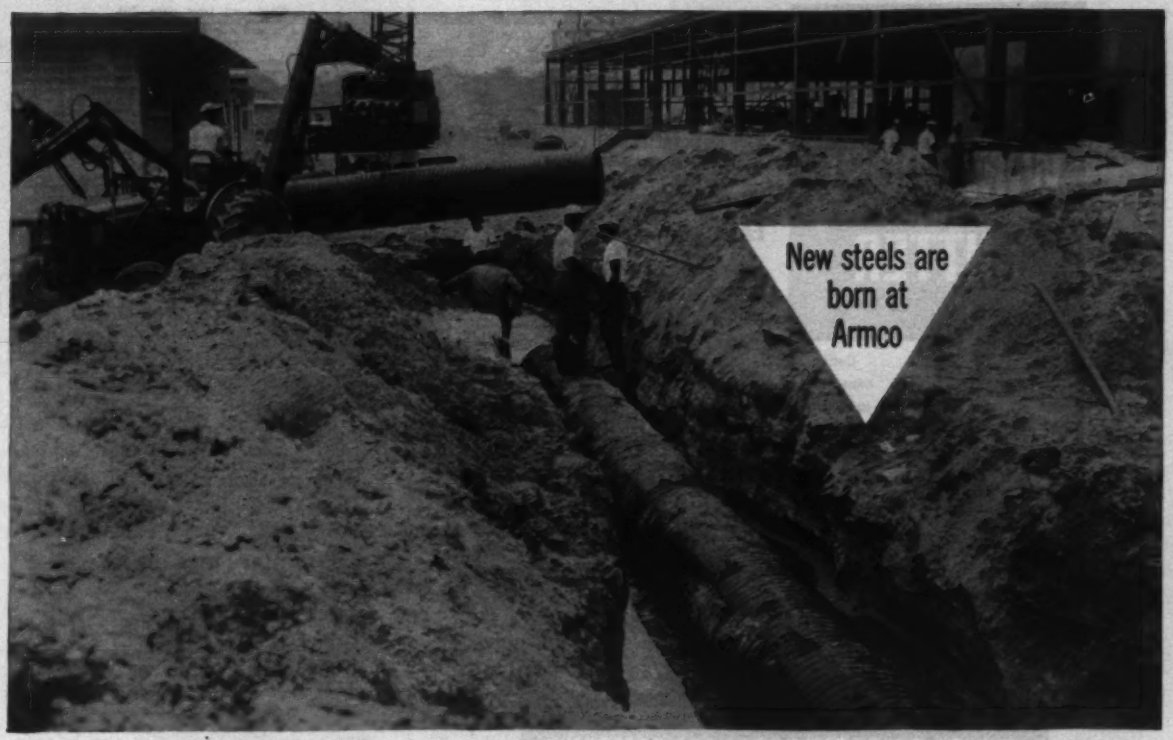
▲ **Wyoming**—COMPRESSOR STATION—Colorado Interstate Gas Co., Colorado Springs, National Bank Bldg., Colorado Springs, Colo., compressor station, Rawlins, $1,750,000. CD 8/1.

PUBLIC BUILDINGS

▲ **Conn., Hartford**—SCHOOL—Town, Bd. Educ., 249 High St., plans by Wilkins & Stecker, 945 Asylum Ave., 2 story Fred D. Wish Elementary School, Barbour St., $1,500,000. Loomis & Loomis, 252 Broad St., Windsor, consult. engrs. Van Zelm, Heywood & Shadford, 1007 Farmington Ave., West Hartford, mech. engrs. CD 10/9.

▲ **Ga., Gracewood**—PATIENTS' WARDS—State Dpt. P. Health, 12 Capitol Square, Atlanta, plans by Gregson & Assocs., Mortgage Guarantee Bldg., Atlanta, patients' wards at Georgia Training School for Mental Defectives. $3,000,000. Ammons, McClure & Cald-

(Continued on page 78)



Armco ASBESTOS-BONDED Pipe being installed at a new plant of the Bestwall Gypsum Company. Lightweight equipment handles 20-foot lengths of pipe. Note water in trench.

Consulting Engineers Chose Armco Pipe for Difficult Industrial Sewer Job

A 3,200-foot combined sanitary and storm sewer was part of a construction project at the new gypsum plant of the Bestwall Gypsum Company, Brunswick, Georgia. Complicating the usual problems were the soil of a tideland area, a high water table, and salt water from the adjacent Atlantic Ocean. Choice of the consulting engineers for this sewer was Armco ASBESTOS-BONDED® Pipe.

These consulting engineers, Johnson & Johnson, Inc., of Chicago, said, "The reasons for selection of Armco ASBESTOS-BONDED Pipe for this installation were: It has excellent corrosion resistant qualities in tideland and salt water conditions as exist in this location; the pipe is of relatively light weight and long lengths, making it suitable for installation in a soil where settlement is a consideration such as in this location; use of positive connections were possible here, thus reducing the problem of the lines pulling apart if settlement occurs; and the pipe was economical to use."

The new Bestwall Gypsum Company plant will make products from gypsum brought in by ocean-going ships.

Armco ASBESTOS-BONDED Pipe, with invert paving plus a double full-coating of asphalt, was supplied in diameters from 8 to 30 inches. Mechanical contractors on the project were James E. Smith & Sons, Inc., of Louisville and Atlanta.

Write us for factual data on Armco Corrugated Metal Structures for sewers and other drainage applications. Armco Drainage & Metal Products, Inc., 4010 Curtis Street, Middletown, Ohio.

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(Continued from page 76)

well, 18 Peachtree Place N.E., Atlanta, consult. engrs. CD 11/21/55.

▲† **Mo., St. Louis**—ADMINISTRATIVE FACILITIES—U. S. Eng., 420 Locust St., administrative facilities, U. S. Army Support Center. $2,188,000.

▲ **N. J., Matawan**—SCHOOL—Bd. Educ., Borough Matawan, plans by Finne Lyman & Finne, 1155 Magnolia Ave., Elizabeth, referendum bonds, Oct. 18, high school, Atlantic Ave., $2,500,000. CD 8/2.

▲ **Tex., Houston**—HOSPITAL—Board for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., 500 bed mental hospital, $3,000,000.

▲ **Tex., Irving**—HOSPITAL—Irving Hospital Authority, Irving, plans by Morris W. Parker, 817 Taylor St., Fort Worth, 100-bed hospital, $1,750,000. CD 5/27/59.

▲ **Va., Richmond**—OFFICE—State Hy. Dpt., 1221 E. Broad St., 10 story office. $5,000,000.

▲ **Wash., Seattle**—EXHIBIT-BANQUET HALL, etc.—City, County-City Bldg., plans by Kirk, Wallace McKinley & Assocs., 615 Lakeview Blvd., exhibit-banquet hall and little theater addns. to civic center, $2,500,000. Bids early 1961. CD 10/24/58.

▲ **Wash., Tacoma**—CIVIC AUDITORIUM—City, City Hall, bond election Nov. 8, civic auditorium, $6,500,000. CD 9/18/59.

▲ **Wis., Madison**—LABORATORY—University of Wisconsin, plans by Grassold-Johnson & Assocs., 734 N. Jefferson St., Milwaukee, Zone 2, biotron laboratory, $1,500,000. CD 8/21/59.

▲ **Ont., Ottawa**—OFFICE—High Comm. for the United Kingdom, Earnscliff, Rockcliffe, plans by United Kingdom Ministry of Works, Archts. Division, Able House, London, England, office, Queen and Albert Sts. $3,000,000.

COMMERCIAL BUILDINGS

▲ **Calif., Altadena**—RECREATION CENTER—Philgare Corp., c/o Clark & Montgomery, archts., 18710 Sherman Way, Reseda, recreation center, incl. 40 bowling alleys, coffee shops, shopping center. $2,000,000.

▲ **Calif., Burbank** — OFFICE — Surety Bond Savings & Loan Assoc., 273 E. Olive Ave., plans by Johnson, Engen & D'Agostino, 4868 Oak Park Ave., Encino, 6 story office, 275 E. Olive Ave. $1,500,000.

▲ **Calif., Canoga Park**—DWELLINGS—Woodruff, Inc., 8929 Wilshire Blvd., Beverly Hills, plans by Harris Rice & Campbell, 8477 Beverly Blvd., Los Angeles, 69 dwellings, Tracts 25443 & 20565. $1,500,000.

▲ **Calif., San Jose**—RESIDENTIAL DEVELOPMENT—First Stockton Corp., 1050 University Dr., Menlo Park and Commonwealth Builders, Inc., Winchester Rd. and David Ave., San Jose, plans by Goodwin B. Steinberg, 302 Main St., Los Altos, Calif., residential development, 440 houses, 100 garden apartments and shopping center, Monterey Rd. (1st Increment of 150 homes and 10 acre shopping center). Total cost, $20,000,000. Constr. to require 2 years before completion.

▲ **Calif., Tustin** — SHOPPING CENTER — Larwin Fund, 8670 Wilshire Blvd., Beverly Hills, reinforced brick masonry shopping center, Newport Ave. and First St. $3,000,000.

▲ **Conn., New London**—DORMITORIES—Conn. College for Women, Mohegan Ave., plans by Shreve, Lamb & Harmon Assocs., 11 E. 44 St., New York, N. Y., 6 dormitories. $3,000,000. Meyer, Strong & Jones, 230 Park Ave., New York, N. Y., consult engrs. Garfinkel & Marenberg, 100 W. 42 St., New York, N. Y., struct. engrs. CD 3/27/58.

▲ **D. C., Wash.**—OFFICE, etc.—International Bank of Washington, 1625 Eye St. N.W., plans by Vlastimil Koubek, 810 19th St. N.W., 12 story, masonry office and garage, 1701 Pennsylvania Ave. N.W. $5,000,000.

▲ **Fla., Fort Lauderdale**—SHOPPING CENTER—Coral Ridge Shopping Center, Lincoln Rd., Miami Beach, plans by Frank Mudano, P.O. Box 1307, Clearwater, shopping center.. $6,000,000.

▲ **Iowa, Davenport**—YMCA-YWCA—Young Men's Christian Assn., 402 Harrison St., and Young Women's Christian Assn., 209 W. 4th St., plans by Stewart-Robinson-Laffan, 601 Brady Ave., YMCA-YWCA Bldg. $1,995,000. CD 2/22.

▲ **Mass., Boston** — LAW CENTER — Boston University, 755 Commonwealth Ave., plans by Edwin T. Steffian, 11 Beacon St., Boston, and Sert, Jackson & Gurley, 4 Brattle St., Cambridge, law school center. $2,000,000. CD 5/26/59.

▲ **Mo., Clayton (St. Louis 5 P.O.)**—CHAPEL, COLLEGE INFIRMARY, etc.—Concordia Theological Seminary, 801 De Mun Ave., Zone 5, chapel, college infirmary, completion of Luther Tower, widening campus roads and drives, conversion of Pritzlaff Library into conference center, faculty lounge and offices. $3,625,000. (Final phases of 10-year expansion program). CD 7/12/44.

▲ **N. J., Paramus**—RESEARCH CENTER—Rexall Corp., Div. United Drug Co., Rivermoor St., Boston, Mass., plans by Finne, Lyman & Finne, 1155 Magnolia Ave., Elizabeth, research center, Century Rd. $3,000,000. CD 8/4.

▲ **N. J., Point Pleasant**—MOTEL, etc.—Philip Comora, 883 Red Oaks Dr., Elberon, plans by Kordys & Oldziey, 1379 Hamburg Turnpike, Wayne, 50 unit motel, boatel, marina, beach and pool, shops, convention hall, Gull Island, $3,000,000-$5,000,000. CD 8/22.

▲ **N. Y., Ithaca**—MATERIALS SCIENCE—Cornell University, Ithaca, plans by Jacob Fruchtbaum, archt.-

(Continued on page 80)

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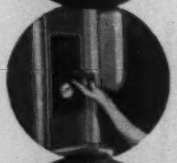

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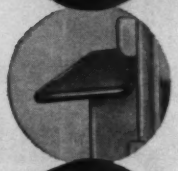

Oak Feedboard (22½"x75") is slanted to just the right degree to aid operator's production, and to reduce fatigue.

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The Revolute Comet—finest in the Revolute line—not only gives you a fast mechanical speed, up to 125 fpm, but all the important *extras* that help convert speed to actual production of top quality prints! Its unique air knife-suction separator assures efficient separation even at highest speeds. Its perforated roller developer section—a Paragon-Revolute exclusive—provides positive one-pass development at any speed, cuts ammonia consumption ¼ to ½ over other designs. Add to these a powerful 7500 watt lamp, reducible by degrees to approximately 50%, precision machined cast aluminum framework, a host of operator conveniences, and you have a whiteprinter that goes far beyond the expected to give you the highest quality and quantity reproduction possible! The Comet comes in 42" or 54" printing width . . . choice of 100 or 150 watt/in mercury arc lamp. For proof of performance and economy beyond the call of duty, mail the coupon below.

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DIVISION OF CHARLES BRUNING CO., INC.

BRUNING

77 South Avenue, Rochester 4, N.Y.

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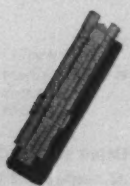
When You Attend a Demonstration of the Comet!



We would like to present you this professional Bruning pocket slide rule at the time you attend a demonstration of the Comet. This quality, all-plastic slide rule contains 9 basic slide rule scales, comes with genuine leather sheath.

Paragon-Revolute Advertising Department, Dept. P9-U
1800 Central Rd., Mt. Prospect, Illinois

☐ Please send me more information about the Comet.

☐ Please arrange for your representative to contact me about a demonstration.

Name_____ **Title**_____

Company_____

Address_____

City_____ **County**_____ **State**_____

(Continued from page 78)

engr., 1965 Sheridan Rd., Tonawanda, materials science bldg. $6,000,000.

▲ O., Akron—HOME FOR AGED—Cleveland Presbytery, c/o Trustees, Westminister Presbyterian Church, 1250 W. Exchange St., Home for Aged, W. Exchange St. $1,800,000.

▲ O., Cincinnati — APARTMENT — Dave Lawrence & Assoc., 509 Madison Ave., New York, N. Y., garden-type apartment project, 13 acres off Seymour Ave. $2,000,000.

▲ O., Cincinnati—HOSPITAL—St. Mary's Hospital, 816 Betts St., plans by Potter, Tyler, Martin & Roth, 128 E. 6th St., 6 story, bsmnt., rein.-con., brick, stone hospital. $5,500,000. Proctor, Ingles & Strauss, 7th and Vine Sts., consult. engrs. CD 9/29/59.

▲ O., Mansfield — SHOPPING CENTER — Owner, c/o Louis Kline, 2765 Sulgrave Rd., Cleveland, Zone 22, plans by Herbert S. Jones, 3 N. Main, 10-20-unit shopping center, Park Ave. West. $2,000,000. CD 8/29.

▲ Pa., Exton — RESIDENTIAL DEVELOPMENT — Daniel M. and Charles L. Tabas, Delaware Ave. and Poolar St., residential development, Lancaster Pike. $2,000,000. Construction Spring 1961.

▲ Pa., Phila. — RESEARCH CENTER — Vertol Division, Boling Airplane Co., Morton, research center, near Phila. International Airport. $2,000,000.

▲ Pa., Wayne — APARTMENTS — Harold D. Greenwell, 1424 Chestnut St., Phila., Pa., plans by George W. Neff, 1250 Locust St., Phila., two 300 unit apartments, Sugartown Rd. $2,500,000. Bids in Fall.

▲ Tenn., Chattanooga—HOSPITAL—Erlanger Hospital, Wiel St., plans by Bianculli & Palm, Volunteer Bldg., hospital addn., west wing, 160 beds, $1,750,000. Campbell & Jones, 1478 Market St., consult. engrs.

▲ Tenn., Knoxville — SHOPPING CENTER—Norwood Shopping Center, Inc., Clinton Highway, plans by Morton & Sweetser, 203 Journal Bldg., Knoxville, shopping center, $2,500,000.

▲ Tenn., Nashville—HOMES, etc.—Cousins-Moore, Inc., c/o Larchwood, Inc., 116 Fulton Federal Bldg., Pryor at Edgewood Ave., Atlanta, Ga., 1,700-home subdivision on Stewarts Ferry pike with shopping center. $17,000,000.

▲ Tex., Dallas—STORE—Jaffe & Martin, 4623 Blanco Rd., San Antonio, store. $2,500,000.

▲ Tex., Dallas—STORE—Montgomery Ward Co., 500 Big Town, Dallas, plans by Williams & Reeves, 3400 University Blvd., 2 story approx. 153,000 sq. ft., masonry, steel frame dept. store, Zangs and Illinois Ave. $2,500,000.

▲ Tex., Houston — STORE, etc. — Joske's of Houston (Div. of Allied Stores Corp.), 407 Main St., plans by Summer Shein, 407 Main St., 3rd suburban department store, $3,000,000; warehousing or storage, $250,000; 4th department store, in S.W. sect. of city, $2,500,000.

▲ Va., Norfolk—APARTMENTS—Ott Investment Corp., 163 W. Olney Rd., plans by Lubin & McGaughy, 220 W. Freemason St., apartments, North Shore Rd. $1,800,000. Bids March 1961. CD 7/6.

▲ N. S., Halifax—SHOPPING CENTER—Webb & Knapp (Canada) Ltd., 926 Dominion Sq. Bldg., Montreal, Que. plans by Graham Consultants, engrs.-archts., 12 Sheppard St., Toronto, Ont., shopping center, Munford and Bayers Rd., Roman Ave. $9,000,000. Keith L. Graham, 53 Spring Garden Rd., Toronto, Ont., assocs. archt. Ellard, Willson Assocs., 669 Bayview Ave., Toronto, Ont., mech. engrs.

▲ Ont., Toronto—WAREHOUSE—Winnipeg Cold Storage Co., c/o Levy Industries, 150,000 sq. ft. refrigerated warehouse, 2 million cu. ft., West Toronto between The Queensway and Queen St. $2,000,000.

▲ Que., Montreal—BANK—Bank of Nova Scotia, 44 King St. W. Toronto, Ont., plans by Durnford, Bolton, Chadwick & Ellwood, 4101 Sherbrooke St. W., and Shoray, Ritchie & Douglas, 4147 Sherbrooke St. W. bank reconstruction and exten., James St. and Victoria Square, $4,000,000.

▲ Que., Quebec City—COLLEGE EXTENSION—College Notre Dame de Bellevue, 1605 Chemin Ste. Foy, Que. plans by Philippe Cote, 19 Bon Aire St., Foy, 4 story college extension. $2,000,000. Paul Boies, 19 Aire St., Ste. Foy, consult. engr.

INDUSTRIAL BUILDINGS

▲ Ind., Anderson — ENGINEERING-RESEARCH CENTER Delco-Remy Div. General Motors Corp., 2401 Columbus Ave., 225,000 sq. ft. engineering-research center, 40 acre tract. $2,500,000. Constr. early 1961.

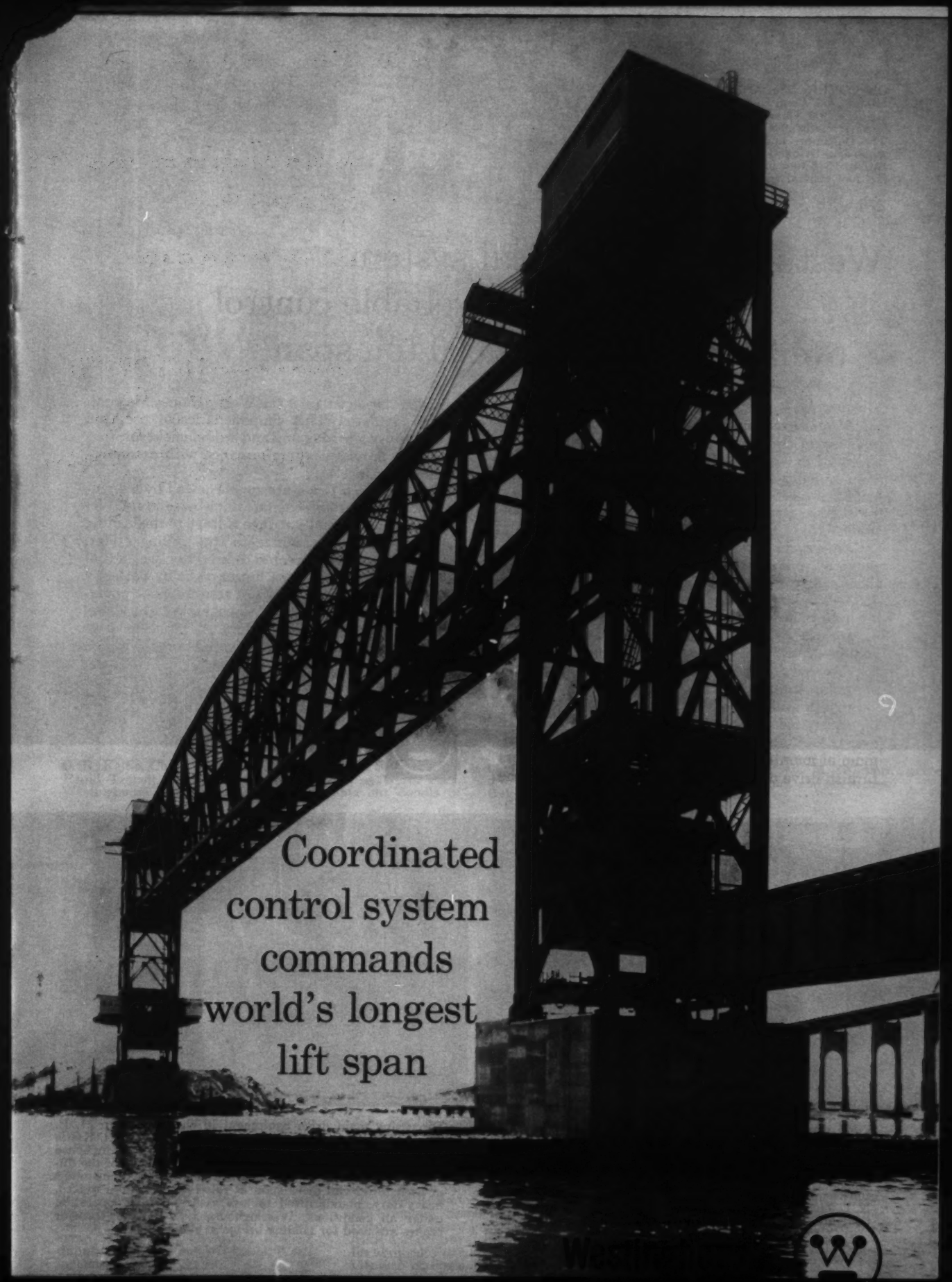
▲ Tenn., Charleston—PLANT—Olin Mathieson Chemical Corp., 460 Park Ave., New York 22, N. Y., chlorine and caustic soda plant, $13,000,000.

▲ Tex., Port Arthur—PLANT etc.—Meredith & Co., and Associated Companies, Bank of South West Bld., Houston, 150 million cu. ft. daily gas processing capacity gas products plant, Port Acres, $4,000,000; equipment repair shop, $150,000; area gas lines, $125,000, Port Acres, near here, Hudson Engineering Corp., 2711 Danville St., Houston, consult. engrs.

▲ Wyo., Casper—REFINERY—Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago 80, Ill., 37,000 bbl. distillation refinery unit, $16,000,000.

AMERICANS ABROAD

▲† Ryukyu, Okinawa—STEAM POWER PLANT—U. S. Eng., Okinawa, 88,000 kw. steam power plant, transmission and tie-in lines. $20,000,000. Kuljian Corp., 1200 N. Broad St., Phila. 21, Pa., U.S.A., engrs.


Coordinated
control system
commands
world's longest
lift span

ON COVER: The Arthur Kill Lift Bridge between Staten Island, N. Y., and Elizabeth, N. J., was designed by Parsons, Brinckerhoff, Quade & Douglas for The Staten Island Rapid Transit Railway Company (a wholly owned subsidiary of The Baltimore and Ohio Railroad Company) and built by American Bridge Division of the United States Steel Corporation. 1645 feet long over-all, the bridge is shown with its 558-foot central span in raised position.

Westinghouse electrical system gives precise, reliable control over vertical lift of 2,000-ton span

The new Arthur Kill Bridge boasts the longest vertical lift span ever constructed. The record length span replaces an old swing bridge whose center pier had become a navigational hazard. Westinghouse equipment quickly and smoothly elevates the span 104 feet to leave a 500-foot-wide clear navigation channel for the passage of ships—lowers the span for rail traffic.

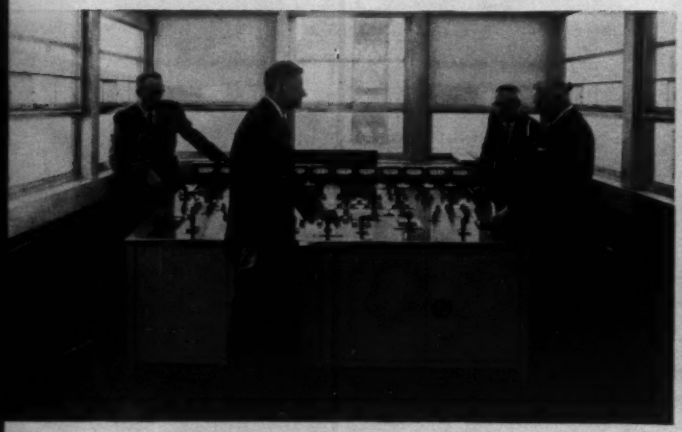
Suspended between two shore towers, the counterweighted main span is operated by giant cable sheaves driven through reduction gearing. Measuring 558 feet in length and weighing four million pounds, it can be raised or lowered through its 104-foot travel in approximately two minutes. The d-c adjustable voltage drive, furnished by Westinghouse, gives precision speed control and holds skew of the span to a minimum throughout the normal operation cycle.

Smooth acceleration to maximum speed and gentle controlled retardation to stop give the bridge every assurance of a long and useful life with a minimum of maintenance. Standardized d-c mill motors furnish drive power for span operation. Heart of the precision speed control is the Westinghouse Magamp exciter regulator. This simplified design uses the completely static Magamp and a single field rotating exciter to provide top performance with extremely low maintenance.

Drives in each tower are synchronized by a sensitive skew detection scheme which uses static elements to automatically reduce voltage to the leading motor and increase voltage to the trailing motor. This system can be expected to keep the two ends of the lift span within close limits of being perfectly level throughout its travel. To assure bridge operation under emergency conditions, a stand-by diesel engine generator set is installed. A duplicate drive system is also provided and is available at the option of the bridge operator at any time. *(cont'd)*

J-94150-2

Westinghouse



View of main control room in east tower, showing desk from which operator controls all main and auxiliary bridge drives. Special instrumentation, including height and skew indicators, keeps bridge tender informed of all operating conditions. Drive system transfer and power source selection is made from this console. W. C. Carl explains conveniently grouped controls to N. L. Ziegler, Division Engineer (left); J. F. Stevens, Superintendent; and P. K. Partee, General Manager.

Discussing main drive equipment in east tower are M. B. Trimble, Westinghouse Construction Engineer; G. R. Keltie and W. C. Carl. Two type MCPA-614, 135-hp Westinghouse mill motors are shown above—one motor for each of the duplicate drive systems. Systems are arranged so that one motor in each tower can drive span at rated speed. These rugged, heavy-duty, standardized motors assure reliable operation under all conditions. Westinghouse type HI-198 thrustor brakes are used for holding bridge at standstill.

G. R. Keltie, Chief Substation Maintainer, The Staten Island Rapid Transit Railway Company, looks on as W. C. Carl, Westinghouse Construction Engineer, points out details of main d-c control panel. This panel contains type M, 800-amp d-c "loop" contactors, span speed, current limit and skew control Magamps with associated auxiliaries.

Incoming 4160-volt power is reduced to 480 volts by this 500-kva Westinghouse power center. Low-voltage switchgear at rear distributes power to main drive system and bridge electrical auxiliaries. Type DB drawout air circuit breakers provide feeder circuit protection. Discussing installation: John Pucillo, Staten Island Rapid Transit Railway Electrician; Max Pilger, Garfunkel Electric Supply Company; and M. Davis, Westinghouse Sales Supervisor.

John Pucillo is seen operating wall mounted AB-I breaker which controls machinery and room heaters. In foreground, main 125-kw type SK d-c adjustable voltage generator driven by 150-hp type CSP* motor. Generator excitation furnished by Magamp exciter regulator determines operating speed of main drive motors. Small unit at near end is a constant potential generator for drive motor fields and control auxiliaries. The d-c supply for duplicate drive system is furnished by identical equipment.

*Trade-Mark

A Westinghouse control center in the east tower switchboard room is examined by Messrs. Partee, Carl and Ziegler. It contains combination starters for 440-volt auxiliary drives and includes a-c relay panels at each end. Compact control centers are composed of interchangeable, space-saving, easily installed modular units.

J-94150-3

Interesting view from mezzanine floor, showing one of four span control auxiliary assemblies. A single machinery take-off to the multiple speed gearbox provides correct ratios to operate type A cam limit switches, height, skew and control transmitters. This construction permitted unit preassembly at machinery builder's plant—assuring fast, easy installation. Seen above: W. C. Carl and G. R. Keltie.

Coordinated control system commands world's longest lift span *(cont'd)*

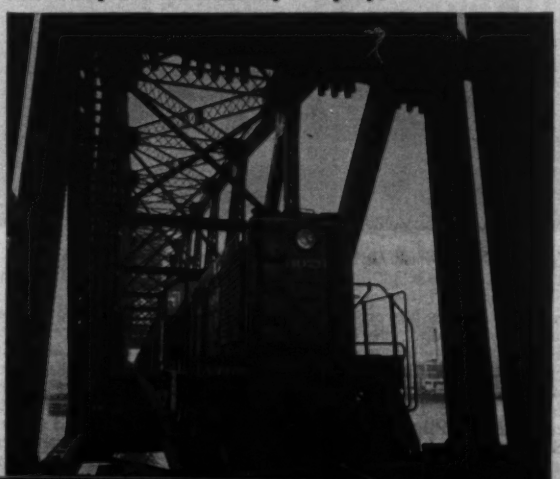
As supplier of the coordinated electrical systems, Westinghouse assumed complete responsibility for their performance. For more information about how this single-source supply can benefit you, contact your nearby Westinghouse construction sales engineer. Or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

OWNER: The Staten Island Rapid Transit Railway Company (a wholly owned subsidiary of The Baltimore and Ohio Railroad Company), Staten Island, N. Y.
CONSULTING ENGINEER: Parsons, Brinckerhoff, Quade & Douglas, New York, N. Y.
GENERAL CONTRACTOR: American Bridge Division, United States Steel Corp., Pittsburgh, Pa.
ELECTRICAL CONTRACTORS: Fischbach and Moore, New York, N. Y.
Lightning Electric Service Co., Newark, N. J.
WESTINGHOUSE DISTRIBUTOR: Garfunkel Electrical Supply Co., Jersey City, N. J.

J-94150-4

Westinghouse

Freight train moving over the recently completed Arthur Kill Lift Bridge is drawn by a diesel engine of The Staten Island Rapid Transit Railway Company.



Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲† **Mass., Falmouth**—ADDITIONAL FACILITIES, IM-99B—BA On Or About 10/11—U. S. Eng., 187 Westminster St., Providence, R. I., addnl. facilities, IM-99B, to incl. twenty-eight 22 x 60 ft. concrete fdns. and floor slab, structural steel frame, etc. launcher shelters; 70 x 83 ft. concrete fdns., floor slab, steel frame Assembly and Maintenance Bldg. "B"; 122 x 162 ft. composite bldg. addn. to existing bldg.; 31 x 58 ft. concrete fdns., floor slab, steel frame, etc. A & M shop addn. existing BOMARC Facility, Otis Air Force Base, ENG 19-016-61-B. $2,000,000-$3,000,000. Plans deposit $10. CD 1/13.

BUILDINGS—LB & CA

▲† **John A. Volpe Constr. Co.,** Inc., 54 Eastern Ave., Malden, Mass., CA **$1,896,000,** THERAPEUTIC BLDG. 82 and BLDGS. 7 and 61, alterations, Veterans Hospital, BEDFORD, MASS. U.S.A. Dir. Design Service, Veterans Administration, Munitions Bldg., Wash. 25, D. C. Bids Aug. 23. CD 8/25, under LB.

▲ **Renba Constr. Co.,** Inwood Road, Woodbridge, Conn., Owner Builds, **$1,500,000,** 120 units, garden type, brick 7 APARTMENT BLDGS., "Hemingway Apartments," Hemingway Ave., EAST HAVEN, CONN. Ryder, Struppman & Neumann, 90-04 161 St., Jamaica, N. Y., archts.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Smithtown**—SCHOOLS—BA 9/26—Bd. Educ., Central School Dist. 1, 21 Oak Ave., Dogwood Elementary School and Mount Pleasant Elementary School, $1,500,000 (separate and/or combination). Garfinkel & Marenberg, 100 W. 42 St., New York, Zone 36, structural engrs. Segner & Dalton, 55 Church St., White Plains, mechanical engrs. CD 8/23.

▲ **Md., Rockville** — SCHOOL — BA 9/27—Montgomery County Bd. Educ., West Bethesda High School, Bethesda. Bids Aug. 17 rejected, LB **$3,005,462,** CD 8/19, under LB.

▲ **N. Y., Kew Gardens**—PARKING GARAGE—BA 10/5—Dpt. P. Wks., Rm. 2200, Municipal Bldg., New York, Zone 7, general contract, plumbing work, electrical work and lighting fixtures for public parking garage, 82 Ave., 126 St., Union Turnpike and 132 St., Queens Boro. Plans deposit $40. CD 1/25.

HEAVY CONSTRUCTION—LB & CA

▲ **Johnson Drake & Piper,** Inc., 86 Trinity Pl., New York, N. Y., CA **$1,739,547,** Contr. N29, Spec. PA-N-23040, incid. Niagara Power facilities involving 6,500 cu. yd. excav. unclassified, 2,200 cu. yd. embankments, etc., between North Grand Island Bridge and Treadway Inn, Niagara Falls, NEW YORK. The Power Authority of State of New York, Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Aug. 25. CD 8/29, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,
N. Y.—**Rusciano Constr. Corp. & Del Balso Contr. Corp.,** 2 Penn P., Pelham, N. Y., CA **$12,696,072,** c. conc. pavt. 2.1 mi., misc. work 0.28 mi., acc. rds. 4.86 mi. b. conc. 5.26 mi., incl 2 railroad grade sep. plate girders, etc., Clove Lakes Expressway, Cont. 1, Int. Rte. Conn. 512 (Goethals Br. approach to Victory Blvd.) Int. Rte. 278, FICLE 60-1, Proj. I-278-1(49), Richmond Boro;
N. Y.—**Hendrickson Bros., Inc.,** 63 N. Central Ave., Valley Stream, N. Y., CA **$4,040,174,** grading, drainage 7.61 mi., b. conc. 11.77 mi., 5 H.G.S. rein.-con. rigid frame, etc. Heckscher State Parkway, Cont. 2 (Southern State Parkway to Sunrise Hy.), HSP 60-1, Suffolk Co. Bids July 28, awarded Aug. 26. CD 7/29, under LB.

▲ **MacLean Grove & Co., Inc.,** 400 Madison Ave., New York 17, N. Y., LB **$1,997,777,** (7 bidders) Contr. 1, Riverdale-Marble Hill Intercepting Sewer, Manhattan Boro, NEW YORK, N. Y. Dpt. P. Wks., Rm. 2200, Municipal Bldg., New York, N. Y. Bids Aug. 31. CD 8/5.
Zephyr Constr. Co., Inc., 7412 New Utrecht Ave., Brooklyn 4, N. Y., LB **$578,300,** (14 bidders), Contr. 2, Marble Hill Pumping Station and force main, structures and equipment, Manhattan Boro (New York, N. Y.).

▲ **Horn Constr. Co., Inc.,** 2174 Hewlett Ave., Merrick, N. Y., LB **$1,573,650,** Contr. EP-110-004 wharf, Berth 50, Elizabeth-Port Authority Piers, ELIZABETH, N. J. Port of New York Auth., 111 8 Ave., New York 11, N. Y. Bids Sept. 7. CD 9/2.

▲ **PENNSYLVANIA**—Pa. Hy. Dpt., 506 North Office Bldg., Harrison. Bids opened 8/5,
Nello L. Teer Co., 212 W. Main St., Trust Bldg., P.O. Box 1131, Durham, N. C., CA **$6,380,012,** (10 bidders), 14,865 ft. divided rein.-con. hy., 14 bridges, Washington City, N. Franklin, Canton, and S. Strabane Twps., Washington Co. Plans deposit $52.50. CD 8/10.

▲ **PENNSYLVANIA**—Pa. Hy. Dpt., 506 North Office Bldg., Harrisburg. Bids opened 7/29,
Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh 25, Pa., CA **$3,327,693,** (4 bidders), Monongahela River bridge superstructure L.R. 113 (19D-20D) W. Brownsville and Brownsville Boros, Washington and Fayette Counties. CD 8/5.

▲ **The Forest Co.,** Rte. 1, Mechanicsburg, Pa., CA **$5,421,000,** Conowingo intake and tunnels, Susquehanna River Water Supply Section No. 3, BALTIMORE, MD. City, Bureau Water Supply, 3001 Druid Park Dr., Baltimore 15, Md. Bids Aug. 10, awarded Sept. 1. CD 8/12, under LB.

BUILDINGS—LB & CA

▲ **M. Melnick & Co., Inc.,** 225 Willow Ave., New York 54, N. Y., LB **$2,813,500,** (15 bidders), general contract SHOP, GARAGE, 58 St. and 53 Ave., Queens Boro, NEW YORK. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Aug. 24. CD 7/29.

▲ **Holger Olsen,** 512 Newbridge Ave., East Meadow, N. Y., CA **$1,896,944,** general contract, SENIOR HIGH SCHOOL, EAST ISLIP, N. Y. Bd. Educ. Union Free School Dist. 3, East Islip, N. Y. Bids Aug. 8, awarded Aug. 23. CD 8/19, under LB.

▲ **Polera Bldg. Corp.,** 100 Soier Rd., Scarsdale, N. Y., CA **$2,132,000,** general contract 146,000 sq. ft. SECONDARY SCHOOL, 5 Bldgs., Woodlands Secondary Education Center, GREENBURGH, N. Y. Bd. Educ. School Dist. No. 8, Town of Greenburgh, 33 West Hillside Ave., White Plains, N. Y. Bids Aug. 8. CD 8/9, under LB.

▲ **Wm. C. Pahl Constr. Co., Inc.,** Syracuse Kemper Bldg., Syracuse, N. Y., CA **$2,594,000,** 29 two story 246 unit APARTMENTS, ITHACA, N. Y. Cornell University, Ithaca, N. Y. Bids July 19. CD 6/29.

▲ **Joseph P. Blitz, Inc.,** 545 Madison Ave., New York 22, N. Y., CA **$6,959,000** general contract Andrew Jackson HOUSES, Proj. NYS-43,868 units, Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids June 21. Grand total $9,339,250, CD 6/23, under LB.
Heating Maintenance Corp. of N. Y., 220 E. 138 St., New York 51, N. Y., CA **$737,950,** heating Andrew Jackson Houses (New York, N. Y.),
Simpson Elec. Corp., 1857 2 Ave., New York 28, N. Y., CA **$727,000,** electric, Andrew Jackson Houses, (New York, N. Y.),
Abraham Newmeyer, 217-02 Jamaica Ave., Queens Village 28, N. Y., CA **$915,300,** plumbing, Andrew Jackson Houses (New York, N. Y.).

▲ **Leon D. De Matteis & Sons, Inc.,** 827 Elmont Rd., Elmont, N. Y., CA Est. **$7,500,000,** 16 story 416 unit, 68,000 sq. ft. River Terrace COOPERATIVE APARTMENTS, 158 St. and Riverside Dr., NEW YORK, N. Y. Klausner Assocs., Inc., 152 W. 42 St., New York 36, N. Y. Samuel Paul & Seymour Jarmul, 89-51 164 St., Jamaica, N. Y., archts. Herman Scherr, 18 John St., New York 38, N. Y., mechanical engr. Abrahams, Hertzberg & Cantor, 207 E. 37 St., New York 16, N. Y., structural engrs.

▲ **S. S. Silberblatt, Inc.,** 25 W. 45 St., New York 19, N. Y., CA **$5,436,000,** general contract Senator Robert A. Taft HOUSES, Section II, Proj. NYC-28.672 units, Manhattan Boro, NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids July 12, awarded Aug. 29, CD 7/14, under LB,
Lipsky & Rosenthal, Inc., 112 St. and Madison Ave., New York 29, N. Y., CA **$594,000,** plumbing, Senator Robert A. Taft Houses, Section II, (New York, N. Y.).

▲ **Stewart M. Muller Constr. Co, Inc.,** 47 S. Riverside Ave., White Plains, N. Y. CA **$2,500,000,** 2 story DINING HALL, AUDITORIUM, TARRYTOWN, N. Y. Marymount College, Tarrytown, N. Y. Bids Aug. 2. Awarded Aug. 29. CD 8/1, under LB.

▲ **Fred Brotherton, Inc.,** 185 Atlantic St., Hackensack, N. J. LB **$1,203,800,** general contract second HIGH SCHOOL, OLD TAPPAN, N. J Northern Valley Regional High School, Demarest, N. J. Frederic P. Wiedersum Assoc., 65 Roosevelt Ave., Valley Stream, N. Y., archts. CD 1/27.

▲ **Marwicke Corp.,** 9762 Bustleton Ave., Phila, Pa., CA **$3,000,000,** 240 unit Garden type APARTMENT, PHILA, PA. Capri Homes, Inc., c/o contractor. A. & J. Di Marco, 9726 Bustleton Ave., Phila, Pa., archts.

▲ **W. H. Ward Contractors,** 712 Ritchie Hy. N., Glen Burnie, Md., CA **$1,998,000,** 1 story Woodlawn JUNIOR HIGH SCHOOL, Woodlawn, TOWSON, MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson 4, Md. CD 8/30, under LB.

▲ **Magazine Brothers Constr. Co.,** Woodward Bldg., Wash., D. C., CA Over **$2,000,000,** 9 story, masonry, concrete APARTMENT and OFFICE BLDG., 168 apartment units, 730-24th St. N. W., WASH., D. C., Continental Apartments, Inc., 1074 National Press Bldg., Wash., D. C. F. Wallace Dixon, 1832 M St. N. W., Wash., D. C., archt.

▲ **Delco Development Corp.,** 6758 Market St., Upper Darby, Pa., Separate Contracts **$1,280,000,** 64 Duplex DWELLINGS, Chapel Ave., CLAYMONT, DEL.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Virginia**—BA On Or About 10/20—U. S. Eng., 502 8 St., Huntington 1, W. Va., intake structure, dam and spillway for John W. Flannagan Dam and Reservoir Proj., Pound River, CIVENG-46-022-61-15. $6,500,000. CD 9/15/59.

BUILDINGS—BA

▲ **Va., Newport News**—HOSPITAL—BA 10/5—Riverside Hospital, 245 50 St., 7 story penthouse, steel frame, concrete, masonry hospital, $6,000,000. Plans deposit $250. Forrest Coile & Assoc., 3415 Virginia Ave., archts. Fraioli-Blum-Yesselman, 1214 Granby St., Norfolk, structural engrs. CD 4/1.

HEAVY CONSTRUCTION—LB & CA

▲† **Clement Bros. Co., Inc.,** Hickory, N. C., CA **$2,598,376,** dam and outlet works, Wilkesboro Reservoir, Yatkin River, near Wilkesboro, NORTH CAROLINA. U. S. Eng., 209 King St., Charleston, S. C. CD 9/15/59.

MIDDLE WEST

BUILDINGS—BA

▲ **Ill., Quincy**—HOSPITAL—BA 10/4—St. Mary's Hospital, Vermont St., 200-bed hospital addn. $3,900,000. Hadley & Worthington, Myers Bldg., Springfield, archts. CD 3/23, under LB.

▲† **O., Toledo**—FEDERAL OFFICE—BA 10/6—General Services Admin., 575 U. S. Court House, Chicago, Ill., 8 story, 180,000 sq. ft. federal office. $5,642,000. Bellman, Gillett & Richards, 1600 Madison, archts. CD 9/19/58.

HEAVY CONSTRUCTION—LB & CA

▲ **INDIANA**—State Hy. Dpt., State House Annex, Indianapolis. Bids opened 8/30,
Ind.—**C. F. Replogle Co.,** 122½ N. Court St., P.O. Box 308, Circleville, O., LB **$1,788,964,** est. $2,049,447, (19 bidders), c. conc. pavement, Contract R-5087; LB **$2,997,577,** est. $3,562,412, (8 bidders), c. conc. pavement, Contract R-5088;
Ind.—**Traylor Bros., Inc.,** Upper Mt. Vernon Rd., Sta. 8, P.O. Box 66, Evansville, Ind., LB **$2,594,177,** est. $3,053,983, (12 bidders), c. conc. pavement, Contract R-5086;
Ind.—**Olinger Constr. Co.,** Olinger Bldg., P.O. Box 96, Huntingburg, Ind., LB **$1,054,190,** est. $1,289,822, (9 bidders), c. conc. pavement, Contract R-5090. CD 8/8.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing, Zone 26,
Mich.—**Holloway Constr. Co.,** 29350 Joy Rd., Livonia, Mich., CA **$1,968,100,** grading, drainage structure 5.076 mi. I-75 from south of M-72 to north of M-93, Crawford Co.;
Mich.—**Pierson Contg. Co.,** 200 Eddy Bldg., Saginaw, Mich., CA **$1,048,296,** grading, drainage structures 4.864 mi. I-75 from north of M-93 north to county Rd. 612, Crawford Co. Bids July 19, awarded Sept. 6 CD 8/25, under LB.

BUILDINGS—LB & CA

▲ **Roediger Constr. Co.,** 1729 Superior Ave., Cleveland 14, O., LB est. **$1,500,000,** (8 bidders), general contract, WOMEN'S DORMITORY at Flora Stone Mather College, CLEVELAND, O. Western Reserve University, 2040 Adelbert Rd., Cleveland 6, O. Bids Aug. 16. CD 7/19.

▲ **Murphy Homes, Inc.,** 7945 Hamilton, Mt. Healthy, O., Owner Builds, **$6,375,000,** 323-1½ story, bsmnt. brick HOUSES, Crest and Pippin Rds., MT. HEALTHY (BR. CINCINNATI), O. CD 4/21.

▲ **Murphy Bros.,** 7945 Hamilton, Mt. Healthy, O., Own Forces, **$2,475,000,** 130 HOMES, 1-fl., 1½ story, bsmnt, on streets off Plainfield Rd., CINCINNATI, O., Awarded Aug. 31, CD 2/19/59.

▲ **Kopf & Kopf, Inc.,** 825 Delta Ave., Cincinnati, O., Own Forces, **$1,500,000,** 40 one-fl., and 2 story, HOUSES, Burney Ln., CINCINNATI, O., CD 4/21.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ **Tex., El Paso**—BANK AND OFFICE—BA 9/20—El Paso National Bank, Texas and Stanton Sts., 18 story, bsmnt., 680,000 sq. ft., masonry bank and office. $8,000,000. Extended date. CD 8/19.

HEAVY CONSTRUCTION—LB & CA

▲ **NORTH DAKOTA**—State Hy. Dpt., Bismarck,
N. D.—**Central States Constr. Co.,** Crosby, Minn., CA **$747,411,** c. conc. 9.55 mi. Interstate 94, Proj. I 94-8 (37) 297, Barnes Co.;
N. D.—**Woodrich Constr. Co.,** 201 18 Ave., South Hopkins, Minn., CA **$809,282,** c. conc. 10.394 mi. Interstate 94, Proj. I-94-8(37) 297, Barnes and Cass Counties. Bids July 29. CD 8/2, under LB.

▲† **Sylvania Electric Products, Inc.,** 100 1st Ave., Waltham, Mass., CA Est. **$3,000,000,** intercommunications sys. for missile sites at Schilling Air Force Base, SALINA, KAN. Strategic Air Command, Air Material Area, Griffiss Air Force Base, Rome, N. Y. CD 11/4.

▲ **Southern Constr. Co., Inc.,** P. O. Box 1307, Augusta, Ga., CA **$2,041,380,** Items, 1, 2, 3, 4, 5; remodeling, impry. 66 Airmen's Barracks, Inv. No. 41-614-61-174, LACKLAND AIR FORCE BASE, TEX. U. S. Govt., Dpt. Air Force, c/o Base Procurement Office, Bid. 5211, Lackland Air Force Base, San Antonio, Tex. Bids July 11. CD 7/21, under LB.

▲† **Sylvania Electric Products, Inc.,** 100 1st Ave., Waltham, Mass., CA Est. **$3,000,000,** intercommunications sys. for missile sites at Francis E. Warren Air Force Base, CHEYENNE, WYO. Strategic Air Command, Air Material Area, Griffis Air Force Base, Rome, N. Y. CD 10/21.

BUILDINGS—LB & CA

▲ **Ray Warfield,** 2310 E. Solway St., Sioux City, Iowa, and **John Kern,** 415 8th St., Sioux City, Iowa, Owners

Build, $2,500,000, Town House MOTEL, swimming pool, 750 car parking, Riverside Interchange, on New Interstate 29 Hy., SIOUX CITY, IOWA. Dillon Hotels Co., 830 Fairacres Rd., Omaha, Neb., Lessee.

▲ **Kesk, Inc.**, 136 S. Derbigny St., New Orleans, La., LB $7,900,024, est. $8,000,000, 510 CAPEHART HOUSING UNITS, Fort Bliss, Inv. No. ENG.-29-005-61-13 (Original Invoice No. 29-005-60-68) EL PASO, TEX. U. S. Eng., P. O. Box 1538, Albuquerque, N. M. Bids Sept. 1. CD 6/16.

▲ **Spaw-Glass, Inc.**, Box 25025, Houston, Tex., CA $1,873,000, JUNIOR HIGH SCHOOL, San Felipe Rd. and Bering Dr., HOUSTON, TEX. Houston Ind. School Dist., 1300 Capitol Ave., Houston, Tex. CD 9/7.

▲ **Leavell Investment Co.**, 1900 Wyoming Ave., El Paso, Tex., CA $7,250,000, construct-lease POST OFFICE facility, HOUSTON, TEX. General Services Admin., U. S. Post Office Dpt., 1114 Commerce St., Dallas, Tex. Bids Aug. 16. CD 8/23, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **HAWAII**—State Hy. Dpt., Purchbowl and Queen Sts., Honolulu,

Moses Akiona, Ltd., 1145 Gulick Ave., Honolulu, Hawaii, CA $1,839,037, Pali Hy. Section, Job No. 8147, Honolulu Co. Bids Aug. 4. CD 7/8.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,

Calif.—Charles L. Harney Inc., 575 Berry St., San Francisco 7, Calif., CA $3,921,424, grading, paving 1.1 mi. 6 lane southern freeway interchange at Alemany Blvd. incl. 4 bridges, 1 pedestrian overcrossing, 10 concrete retaining walls, storm sewers, San Francisco Co.;

Calif.—Clifford C. Bong, 123 North Third Ave., Arcadia, Calif., CA $2,490,427, grading, paving 4 lane freeway, 7 bridges 3.9 mi. US Hy. 101 between 0.4 mi. north of State Sign Rte. 36 and 0.3 mi. north of Fortuna to by-pass Fortuna, Humboldt Co. CD 8/26, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

R. E. Hazard Constr. Co. & W. L. Maxwell, Box 3217, San Diego, Calif., CA $5,219,340, eight lane freeway, frontage roads, 15 bridges and retaining walls, XI-SD-2-SD, San Diego Co. Bids Aug. 25. CD 8/29, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 9/7,

Fredericksen & Kasler, 212 13 St., Sacramento, Calif., LB $7,093,320, (5 bidders), 13.3 mi. four lane freeway, US Hy. 99 between 3.9 mi. south McKittrick Rd. and Ming Ave. incl. 15 traffic separation structures, Kern Co. CD 8/3.

BUILDINGS—LB & CA

▲ **Crown Constr. Co.**, 509 West Pico Blvd., Los Angeles, Calif., LB $2,363,711, (5 bidders), THEATRE ARTS BLDG., University of California, LOS ANGELES, CALIF. Bd. Regents, University of California, 405 Hilgard Ave., Los Angeles, Calif. Bids Sept. 1, CD 7/28.

▲ **S. Von Kreedman**, 9350 Wilshire Blvd., Beverly Hills, Calif., CA $2,400,000, 3 story OFFICE, Sunset Blvd. and Vermont Ave., LOS ANGELES, CALIF. Calif. Federal Savings & Loan Assoc., 5680 Wilshire Blvd., Los Angeles, Calif. Honnold & Rex, 9026 Melrose Ave., Los Angeles, Calif., archts.

▲ **Bd. Supervs. Orange Co.**, Court House, Santa Ana, Calif., rejected bids Aug. 3, 5 story General HOSPITAL, SANTA ANA, CALIF. $5,000,000. CD 6/16.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Ont., Toronto**—BA 9/27—Municipality of Metropolitan Toronto, 67 Adelaide St. E., rein.-con., structural steel elevated structure, F. G. Gardiner Expressway, Station 257-09.00 to Station 267-64-39, Contr. R-27-60. $3,500,000. Plans deposit $100. Lakeshore Expressway Consultants, 30 Eglinton Ave. E., Toronto, Ont., engrs. CD 11/30/54, under Streets and Roads.

BUILDINGS—BA

▲ **Que., Montreal**—SCIENCE, etc.—BA 9/27—Loyola College, 7174 Sherbrooke St. W., (selected list bidders), 4 story, structural steel, brick science, auditorium and library, $1,500,000. Peter Dickinson, 1374 Sherbrooke St. W., archt. Brett, Ouellette, Blauer Assoc., 1010 St. Catherine St. W., engrs. CD 6/17.

▲ **Ont., Toronto**—HOSPITAL—BA 9/20—Municipality of Metropolitan Toronto, 67 Adelaide St. E., 9 story, rein.-con. Riverdale Hospital, Broadview Ave. $5,000,000. Plans deposit $200. Extended date. Chapman & Hurst, 416 Moore Ave., Toronto, Ont., archts. C. D. Carruthers & Wallace Consultants Ltd., 92 Yorkville Ave., engrs. CD 8/26.

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Dawson, Wade & Co. Ltd., 775 Clark Drive, Vancouver, B.C., LB $1,656,115, Trans Canada Hy. construction 6.97 mi., Delta District. CD 8/3.

▲ **Tide Bay Dredging Co. Ltd., & J. A. Jones Constr. Co.**, ft. Victoria Dr., Vancouver, B. C., CA $2,447,000, 4-mile outfall channel and 2½ mi. jetty, Iona Island Sewage Treatment Plant Proj., VANCOUVER, B.C. Greater Vancouver Sewerage & Drainage Dist. 2294 W. 10 St., Vancouver, B.C. Bids Aug. 15 CD 8/4.

▲ **Standard Paving & Material Ltd.**, 48 St. Clair Ave. W., Toronto, Ont., CA $3,737,777, 200 x 9,500 ft. runway, parking apron, Malton Airport, TORONTO, ONT. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Aug. 4, awarded Aug. 30. CD 8/9, under LB.

BUILDINGS—LB & CA

▲ **Dominion Engineering Works Ltd.**, Lachine, Que., CA Est. $30,000,000, equipped, BLOOM and PLATE MILL to produce hot rolled steel sheets and light plates, SAULT STE. MARIE, ONT. Algoma Steel Corp. Ltd., Queen St. W., Sault Ste. Marie, Ont. Awarded Sept. 2. CD 6/11/59.

▲ **A. N. Bail Cie. Ltee.**, 2100 Mackey St., Montreal, Que., LB $1,650,000, HIGH SCHOOL, Beurling Ave., VERDUN, QUE. Verdun Catholic School Comn., 4480 Blvd., Champlain., Verdun, Que. Bids Aug. 22. CD 8/9.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **AFGHANISTAN** — International Cooperation Administration, 815 Connecticut Ave. N.W., Wash. 25, D. C., U.S.A., for Royal Govt. of Afghanistan, Kabul,

A. L. Dougherty Overseas, Inc., 420 Lexington Ave., New York, N. Y., U.S.A., CA Over $3,000,000, 70 mi. shaping and paving Kandahar-Spin Baldak Hy. Awarded Aug. 16. CD 5/3, under LB.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—BA

▲† **Canal Zone**—AIRPORT IMPRVS.—BA About 10/20—U. S. Eng., P.O. Box 4970, Jacksonville 1, Fla., U.S.A., runway, taxiway and apron paving and lighting involving 272,000 sq. yd. variable crushed stone base with concrete surf. course over existing concrete surf., 8,000 cu. yd. unclassified excav., 3 mi. graded roads to Beacon Sites; airfield lighting, incl. runway edge, threshold, taxiway lighting, 125 KW generator and bldg., control vault work and station beacon, gas operated obstruction lights, Howard Air Force Base, ENG-08-123-61-23. $1,500,000. CD 9/11/58.

BUILDINGS—LB & CA

▲ **W. B. Uhlhorn Constr. Co.**, 3201 S. Hy. 77, Harlingen, Tex., CA $2,306,542, 84 unit HOUSING, Balboa Heights, CONAL ZONE. Panama Canal Co., 21 West St., New York, N. Y., U.S.A. Bids July 22, awarded July 26. CD 8/1, under LB.

When you face your jobsite with a shovel in one hand and a life preserver in the other, it's time to call STANG. We'll dewater your excavation quickly, efficiently and economically.

John W. STANG Corporation

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Will your bond-financed sewer system serve for generation after generation, far beyond the date the last bond is paid? Or will it have to be replaced before the bonds are retired.

The surest way to make certain today's dollars are buying generations of dependable service is to specify Clay Pipe . . . *it never wears out.* Clay Pipe does not rust, rot, corrode, or disintegrate. New long lengths with factory-made compression joints make Clay Pipe easier to install and tighter than ever before. Clay Pipe handles ground garbage, detergents, hot liquids, chemicals, acids, anything that empties into the sewer. When you specify Clay Pipe you'll never have to apologize for it or explain any failures. You'll be sure it will still be in service long after the bonds have been retired . . . Only Clay Pipe has *all* the features you can trust!

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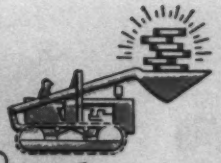
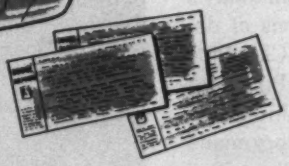
Want a bigger share  of the new building contracts in your area?

Want to be sure you're not missing good bidding opportunities? Want a reliable way to size up jobs...to go after the ones that will do you most good ? You need daily Dodge Reports  !!

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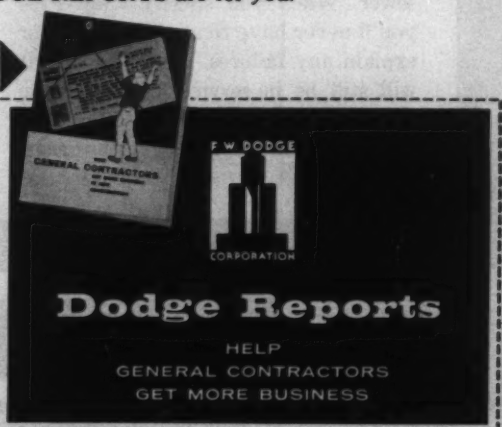
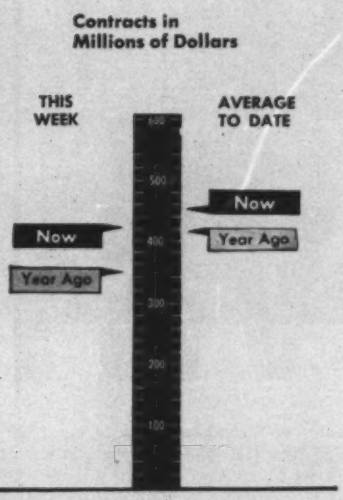


Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

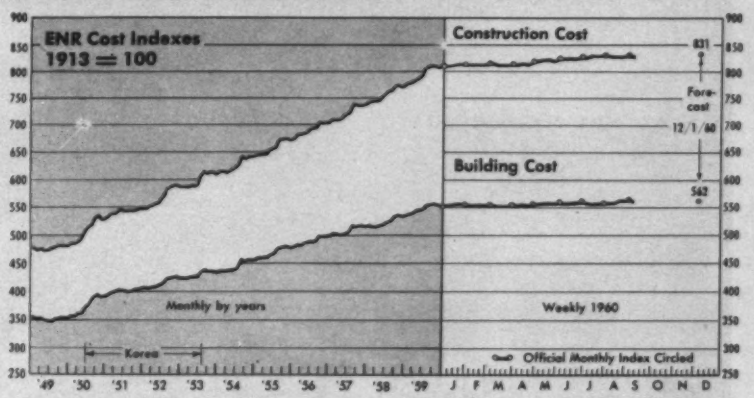
Contracts Awarded In 50 States By Type	This Week millions	Cum. 37 wks 1960	Chge '59-'60 %
All Heavy Construction	$423.3	$16,680.3	+10
By Ownership			
PRIVATE	178.2	8,970.3	+19
PUBLIC	245.1	7,710.0	+ 2
State & Municipal	215.2	5,930.7	+10
Federal	29.9	1,779.3	−19
By Type of Work			
PUBLIC			
Waterworks	13.4	334.8	+10
Sewerage	12.1	420.4	−12
Bridges*	15.4	586.0	+34
Highways	82.2	2,419.8	+ 7
Earthworks, Dams & Waterways	12.9	587.2	−12
Buildings:			
Excl. Housing	54.5	1,758.2	− 8
Housing	23.9	514.1	+ 4
Unclassified	30.6	1,092.3	+ 4
PRIVATE			
Buildings:			
Mass Housing	109.4	4,473.7	+32
Commercial	35.6	1,795.7	+ 9
Industrial	27.6	2,056.4	− 4
Unclassified	5.7	641.7	+70

* Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000 other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Sept 12	Cum. 36 wks 1960	Chge '59-'60
	millions		%
Corporate Securities	$ 56.1	$2,138.5	−18
State and Municipal:			
All Except Housing	24.6	4,667.6	+ 8
Housing	...	185.5	+147
Federal Loans	2.3	122.9	+24
Federal Aid	...	2,717.8	−13
Total Nonfederal	$ 83.0	$9,832.4	−4
Federal Appropriations:			
Projects in U.S.	...	$2,556.1	+108
Outside U.S.	...	157.8	+3486
Total New Capital	$ 83.0	$12,546.2	+9



ENR INDEXES (1913=100), 20-cities' average	Week of Sept. 8 1960	% Change from Aug. 11 1960	% Change from Sept. 10 1959
Construction Cost	830.48	+0.07	+2.27
Building Cost	562.15	+0.15	+1.16

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.880; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

CONTRACTS AWARDED

	1960 Aug. (millions)	1960 8-Mos. (millions)	Percent Change from 1959 Aug.	Percent Change from 1959 8-Mos.
Total U. S. (50 States)	$1,858.7	$15,225.8	+24	+10
Private	964.7	8,181.2	+24	+20
Public	894.0	7,044.6	+24	−1
State and Municipal	726.0	5,390.9	+34	+8
Federal	168.1	1,653.6	−7	−21
ENR Volume Index, 1913=100	632	607	+24	+6

NEW CONSTRUCTION CAPITAL

Total U. S.	594.9	10,946.7	−84	+9
State and Municipal Bond Sales	417.3	4,681.5	−14	+2
Corporate Security Sales	167.6	1,956.4	−8	−23
Federal Loans, Aid (nonfederal work)	9.9	2,833.9	−99.7	−1
Federal Appropriations, (federal work)*	0	1,474.9	−100	+255

* Includes funds for outside U. S.

MATERIALS SHIPMENTS

	1960 June (J) July (Jl)	Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur Mines, thous bbls	32,674(Jl)	168,268(7)	−12	−11
Concrete Paving Awards, PCA, thous sq yd	10,637(Jl)	61,272(7)	−9	−3
Fabricated Structural Steel, thous tons	301(Jl)	1,932(7)	+26	+2
Bookings, AISC, thous tons	270(Jl)	2,006(7)	+4	+7
Reinforcing Bars, Net, AISI, thous tons	210(J)	1,037(6)	−39	−26
Lumber, NLMA, mil fbm	2,605(Jl)	21,145(7)	−17	−1
Orders, mil fbm	2,646(Jl)	19,945(7)	−17	−6
Production, mil fbm	2,693(Jl)	20,833(7)	−14	−0.3
Clay Products, Bureau of Census				
Brick, Unglazed, Common, Face, mil bri	685.6(J)	3,115.8(6)	−7	−10
Vitrified Clay Sewer Pipe, thous tons	190.8(J)	872.1(6)	−2	−5
Structural Tile, Unglazed, thous tons	47.5(J)	250.2(6)	−5	−7
Asphalt Products, Bureau of Census				
Asphalt Roofing, thous sales sqs	5,980.6(J)	24,965.8(6)	+8	−8
Asphalt Siding, thous sales sqs	72.2(J)	352.9(6)	+5	−14
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable), mil lbs	114.5(J)	629.5(6)	−16	−4
Wire and Cable, mil lbs	29.0(J)	148.1(6)	−4	−4
Extruded Shapes (soft alloys), mil lbs	73.9(J)	411.4(6)	−19	−6

EMPLOYMENT AND FAILURES

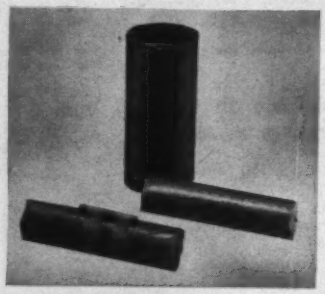
Contract Const Employment, BLS, thous	3,102(Jl)	2,662(7)**	+2	+1
Contractor Failures, Dun & Bradstreet				
Number	192(Jl)	1,468(7)	+40	+25
Liabilities, thous	$11,073(Jl)	$96,414(7)	−2	+43

** Average per month

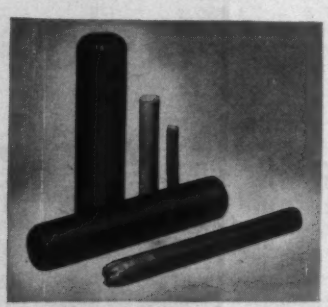
WHEN BLASTING CONTROL REALLY COUNTS...

WHICH EXPLOSIVE?

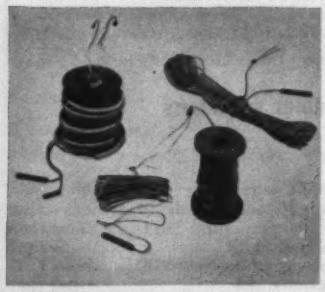
ATLAS PELLETS, a new form of ammonium nitrate, have both the density and sensitivity for efficient AN-oil blasting.



GIANT "75" PRIMERS have the wallop for complete detonation of both field mixed and plant mixed blasting agents.



GIANT GELATINS are for high velocity shattering action. Advantageous for wet work and hard, tight shooting.



ROCKMASTER® electric blasting caps achieve the staggered action so important for better breakage and control.

When you use the right combination,
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moves in sooner...
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produces more.

In the center of Stroudsburg, Pa., a cut 2500 feet long and 85 feet deep had to be blasted out of the mountain-side for construction of the new U. S. Route 611. Some residences were as close as 100 feet from the construction site. The job called for real controlled blasting and virtually no vibration.

Working with an Atlas Technical Representative, the contractor, J. H. Beers, Inc., studied the site, the rock strata, and the surrounding area. Relying on advanced blasting technology to assure absolute control, they planned their blasting methods.

Which explosive for controlled blasting? It all depends on your rock strata and conditions. But, in this case they used Gianite pre-mixed ammonium nitrate blasting agent, detonated with Rockmaster millisecond delay electric blasting caps. The 2½-inch holes were spaced 7 feet apart, and were drilled to an average depth of 10 feet with 6 feet of stemming. In the sequence of photos, notice the "rippling" effect resulting from the use of the full Rockmaster series. There is no flying rock or noticeable vibration. The explosives energy is used only to uniformly break the rock and leave it in place for easy, efficient digging.

This blast is a dramatic example of the sometimes necessity for real controlled blasting. But blasting control should not be a sometimes practice. Controlled explosives energy not only breaks rock uniformly and thoroughly, but also means more economical operation. When you select the right combination of explosives, blasting agents, and blasting techniques, all your equipment moves in sooner, works faster, produces more. Helping you select the right combination is the job of your Atlas Representative. Backed by the complete Atlas line (including all forms of ammonium nitrate), he can help you get maximum control on every shot.

Our blasting cost chart, slide rules, and technical literature are designed to help you achieve maximum control and determine your lowest true blasting costs. Ask your Atlas Representative about them—or, write directly to:

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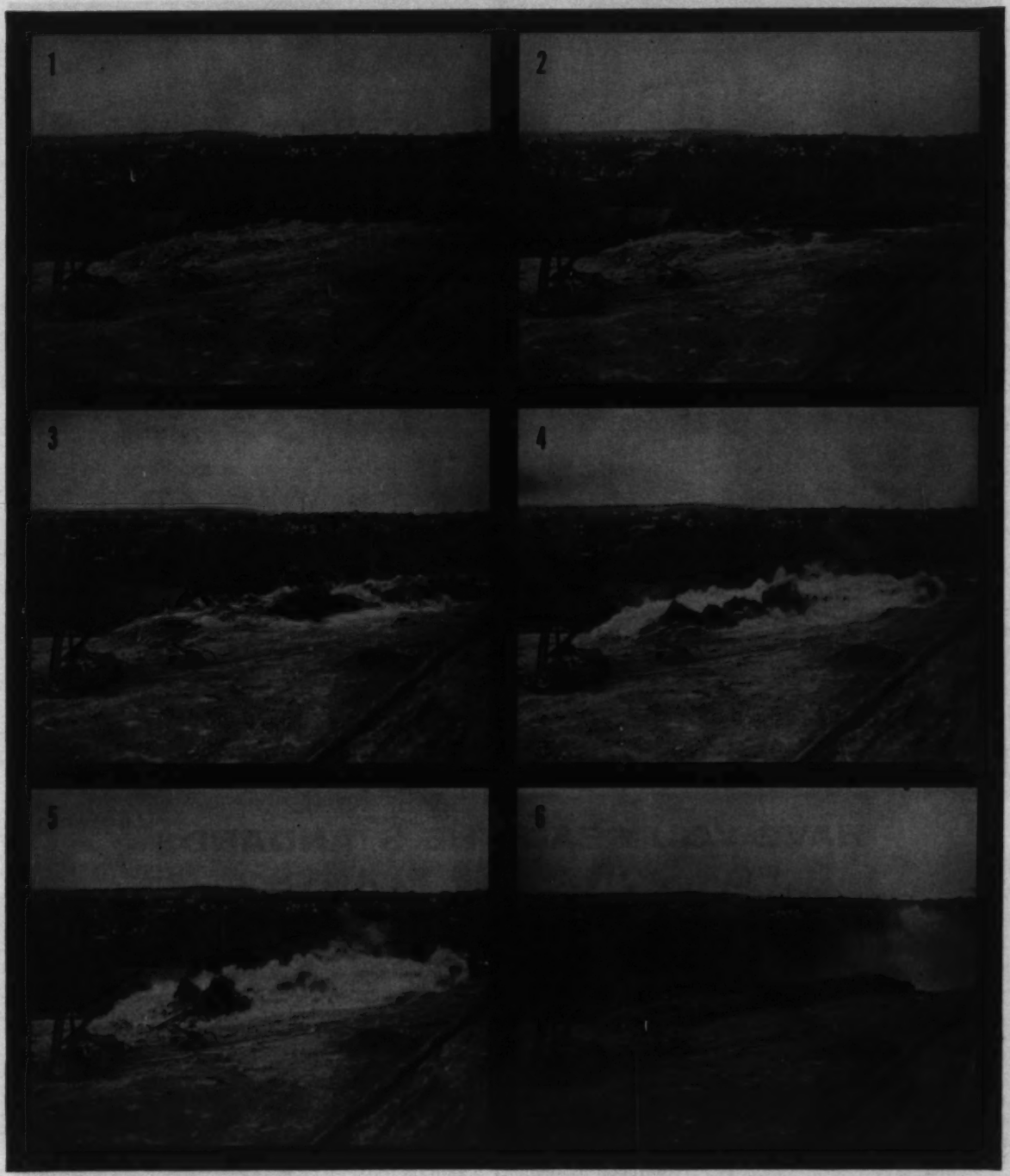
Explosives Division, Wilmington 99, Del.



STROUDSBURG, PA. BY-PASS ON U.S. RT. 611 • CONTRACTOR: J. H. BEERS, INC., BANGOR, PA.

Rockmaster® millisecond delay electric blasting caps detonate Gianite pre-mixed ammonium nitrate blasting agent in this controlled shot. Explosives force breaks rock uniformly and thoroughly for easy digging. In-place blasting eliminates rock throw in congested areas. You'll get safer blasting . . . fewer complaints from near-by neighbors.

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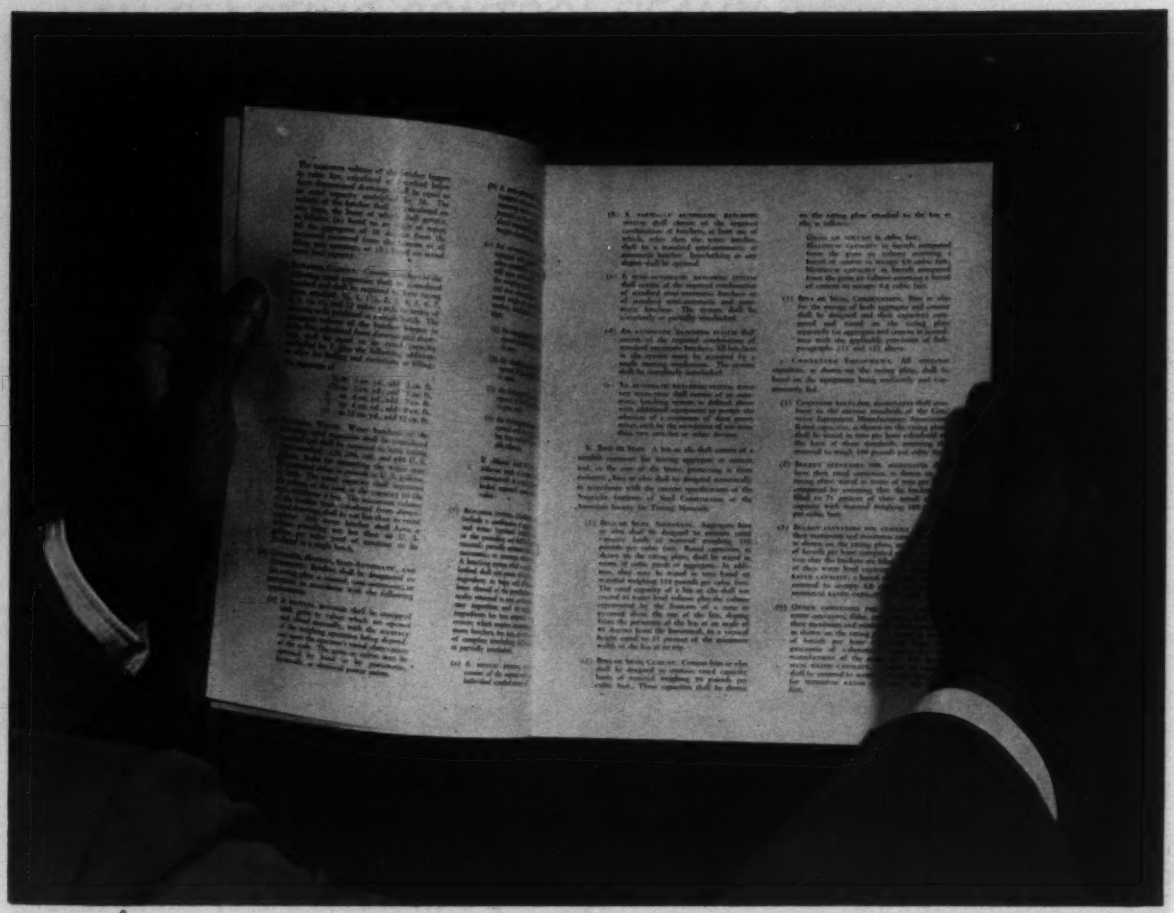


HAVE YOU READ THE STANDARDS FOR CONCRETE PLANTS?

For producers of quality concrete, here is important new information.

It is the compilation of "Concrete Plant Standards" developed by the Concrete Plant Manufacturers Bureau and adopted by its members, who have built most of the plants in use today.

These member companies represent a combined total of 229 years in concrete plant manufacturing They have pioneered progressive plant design, and through continuous development, improved plant components and their operational efficiency — the sound foundations for quality standards.

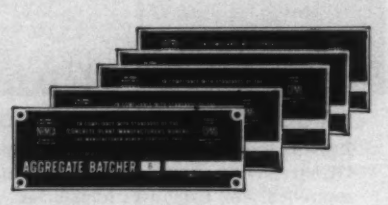
These industry standards, approved by the Board of Directors of the National Ready Mixed Concrete Association, establish capacity ratings for all types of bins, silos, batchers, elevators and conveyors which store and process cement and aggregates. They define the bases on which capacities are rated. They wipe out confusion over nomenclature by providing standard terms for plant components.

Certified by Rating Plate

All equipment built to comply with these requirements and now being shipped by member manufacturers bears a Rating Plate certifying capacity and compliance.

Copies of Standards Available

Users of cement and aggregate handling equipment, and engineers, will find a copy of these standards valuable. They represent another step in the technological progress of the construction industry. Direct your request to the Concrete Plant Manufacturers Bureau, 1411 K Street N. W., Washington 5, D. C.



CONCRETE PLANT MANUFACTURERS BUREAU (CPMB)

An affiliate of the National Ready Mixed Concrete Association

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THE C. S. JOHNSON COMPANY
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NOBLE COMPANY
Oakland, Calif.

U.S. Industry Goes to Europe

- **Producers plan percentage cut in Latin America's share of their world-wide investment in plant.**
- **But actual dollar outlays in the region will rise, reversing plans reported earlier.**

American petroleum and manufacturing companies plan capital outlays abroad this year of $2.4 billion. That's a 15% boost over 1959's actual world-wide expenditures. And present indications are that spending in 1961 will climb 6% above 1960's foreign investment, to $2.54 billion.

The trend of spending continues away from Latin America and toward Europe, particularly the Common Market countries of France, West Germany, Italy, Belgium, the Netherlands and Luxembourg. However, actual dollar volume in Latin America will increase this year and next (see story, p. 96).

These are among the key findings in the second study of foreign operations of U.S. industrial companies conducted in August by the McGraw-Hill Department of Economics. The companies surveyed account for about three-fourths of all overseas investment annually by U.S. manufacturing and petroleum companies.

Spending by manufacturing companies probably will set a new record both in 1960 and 1961, increasing this year by 21% over 1959, followed next year by 15.8% boost over this year's estimated expenditures.

This year, expenditures are expected to top $1.1 billion, and next year the total is placed at $1.3 billion. The outlays for each of 1960 and 1961 compares with manufacturers' foreign investment of $929.4 million in 1957, when overseas spending by both manufacturers and petroleum companies hit a record $2.5 billion.

To a large extent, U.S. contractors and engineers cannot compete effectively for jobs in Europe, where local firms have a big on-the-spot advantage. In Latin America, however, U.S. construction companies can compete on even terms with European firms, and perhaps with a slight edge.

So there's good news in the study's report that U.S. manufacturing companies have revised upward their spending plans for 1960 in Latin America, as compared to the estimates they reported in 1959. Then, 1960 outlays were expected to total $142.8 million (ENR Aug. 13, 1959, p. 21). Now they are estimated at $237.6 million.

The basic trend, however, is readily apparent. In 1958, manufacturers spent $761.6 million abroad. Of this total, 28.4% went to Latin America and 31.2% to Europe. Last year, manufacturers' foreign outlays were $934.7 million and of the total, 25% was invested in Latin America and 40.5% in Europe.

This year the percentage going to Latin America will drop even more sharply, while Europe's portion will climb as steeply (see table). Latin America this year will get $237.6 million, or only 21.1% of the year's manufacturers' estimated outlays of $1.1 billion. Europe will get $500.9 million, or 44.5%. The percentage decline is expected to continue next year when 19.8% of the $1.3 billion of investment will go to Latin America, compared to 49.9% for Europe.

Within the manufacturing industries, the machinery companies (including electrical) plan to spend the largest amount—$351.1 million. These firms also plan the largest percent increase, 41% more than last year. They also

(Story continued p. 96)

Where U.S. Industry Will Invest Abroad

(millions of dollars)

	Canada			Latin America			Common Market Countries			Rest of Europe			Other		
	Actual	Planned		Actual	Planned		Actual	Planned		Actual	Planned		Actual	Planned	
INDUSTRY	1959	1960	1961	1959	1960	1961	1959	1960	1961	1959	1960	1961	1959	1960	1961
Primary Metals	$6.3	$15.5	$4.4	$86.7	$53.0	$73.7	$5.2	$5.7	$3.6	0	0	$.9	$6.3	$7.3	$6.2
Machinery, Including Electrical	34.9	38.6	37.0	42.3	84.3	69.8	69.7	87.8	127.3	74.7	91.3	119.2	27.4	49.1	57.5
Transport Equipment Including Autos	32.3	23.3	24.8	25.8	33.6	37.2	53.9	98.2	99.3	77.6	75.0	121.0	25.8	28.4	27.9
Other Metalworking	14.3	9.0	10.1	5.4	4.6	9.7	8.2	7.5	8.0	3.8	3.8	6.2	0	.8	.7
Chemicals	68.8	71.5	68.6	40.1	37.0	48.6	15.3	54.2	91.4	45.8	44.3	22.9	21.0	39.4	54.3
Paper	27.9	28.8	29.0	0	.3	.6	0	0	0	2.8	1.6	2.3	.3	.3	.3
Rubber	7.1	23.9	18.4	25.1	10.2	10.5	2.2	6.2	19.1	5.9	2.8	5.3	14.2	13.6	12.5
Stone, Clay & Glass	5.7	3.7	14.5	4.3	8.7	0	1.4	4.1	0	.9	.9	0	.6	.3	0
Food & Beverages	15.1	18.8	17.7	2.0	4.7	6.9	1.3	4.3	2.2	9.6	10.3	13.4	4.9	4.7	3.0
Misc. Manufacturing Including Textiles	7.8	10.6	8.2	1.9	1.2	.9	.1	1.2	4.6	.9	1.7	4.0	1.1	.4	.6
ALL MANUFACTURING	220.2	243.7	232.7	233.6	237.6	257.9	157.3	269.2	355.5	222.0	231.7	295.2	101.6	144.3	163.0
Petroleum Industry	274.3	266.5	174.1	388.6	367.9	385.4	137.2	152.2	174.1	137.2	152.2	149.2	205.7*	329.9*	360.5*

** $125 million of this total went to the Middle East in '59. And of the 1960 total, $152.2 million will be spent in the Middle East, while $161.6 million of this total will go to the same region in 1961.*

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losing no time!

Not Cousin Willie. He's used to working with Tyton® fastest, simplest, easiest to install pipe that ever snuggled into a trench.

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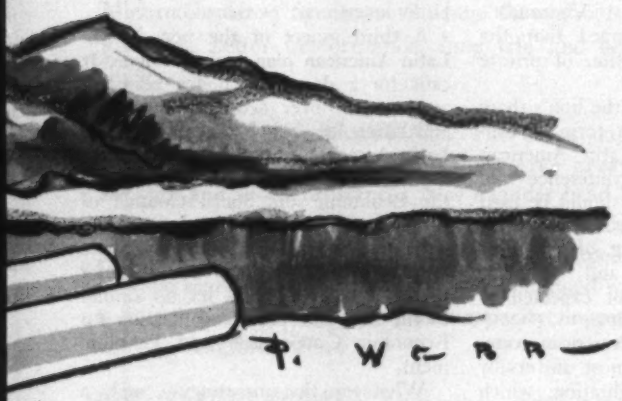

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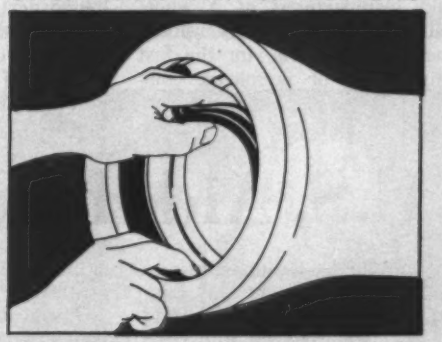
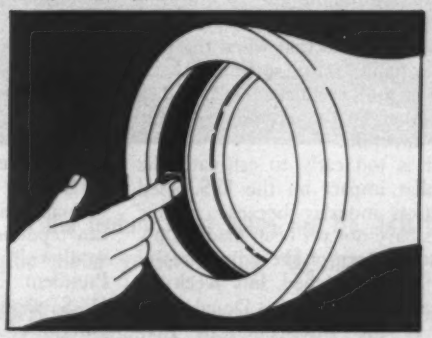
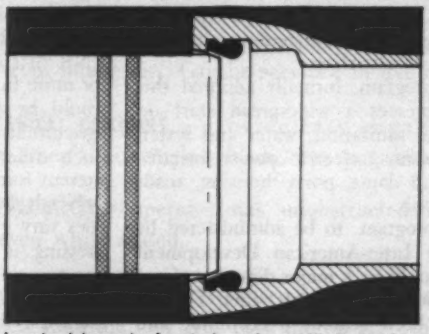


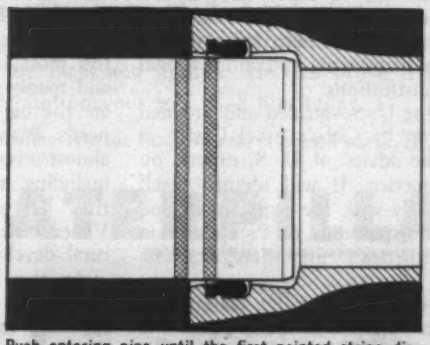
Insert gasket with groove over bead in gasket seat . . . a simple hand operation.



Wipe film of Tyton Joint® lubricant over inside of gasket. Your receiving pipe is ready.



Insert plain end of entering pipe until it touches gasket. Note two painted stripes on end.



Push entering pipe until the first painted stripe disappears and the second stripe is approximately flush with bell face. The joint is sealed . . . bottle-tight, permanently! The job's done . . . . fast, efficiently, economically. Could anything be simpler?

are planning to boost their investment to $410.8 million next year.

Should manufacturers as a whole carry out current plans, their overseas investment in 1961 will, for the first time, top those of petroleum companies.

Petroleum companies reporting in this survey plan to spend $1.3 billion this year for overseas facilities and $1.2 billion next year.

Almost all the overseas investment of American companies will go for the purchase of new plants and equipment. Manufacturing companies indicate that only 7%, or $70 million, of their 1959 investment abroad was for land and existing facilities. This year, outlays for land and existing plant will take 10.3%, or $131 million, of total estimated expenditures. Next year, however, the percentage of expenditures for land and existing plant will drop to 8.1%, or only $105 million.

. . . U.S. Aid Heads for Latin America

While private U. S. industry is reducing capital investment in Latin America in relation to its total worldwide outlays (see page 93), the U. S. government is preparing to pour an additional half-billion dollars into the region. And that's just a start.

Chances are good that when the program eventually starts moving, U. S. contractors and engineers will find a large number of those dollars flowing in their direction.

But it is too early to estimate the exact dollar impact on the U.S.-based construction industry because specific proposals have not yet been made. Only the broad outlines of the economic aid planned were sketched last week by Undersecretary of State Douglas C. Dillion at the Inter-American Economic Conference at Bogota, Colombia. However, within those broad outlines it is obvious that the types of projects involved will require engineering and construction.

The program, formally adopted this week, foresees a widespread start on irrigation, sanitation, water and waterways systems; electric power installations; and dams, ports, housing, roads and schools.

The program, to be administered by the new Inter-American Development Bank, would be a major departure from U. S. policy in recent years. Foreign aid has been geared to economic and industrials, ranging from balance of payments loans to export credits and the financing of basic industrial plant. Social projects have been left primarily to local governments and international lending institutions.

Now the U. S.—goaded and prodded into action by Cuba's Fidel Castro—is taking the advice of U. S. experts on Latin America. It will identify itself more closely with the rising social and economic aspirations of the people in Latin America's underdeveloped regions.

Even though the funds will not be "tied" to purchase of U. S. goods and services, Washington officials say the U. S. contractors operating in Latin America will obtain most of the business. They will be competing, however, against European, Japanese and local contractors.

There may be some hurdles to clear before the aid program moves into high gear, including, in some cases, a clash of economic philosophies and objectives.

The U. S. will stress the maximum use of private enterprise. Mr. Dillon emphasized that local governments in Latin America must help create a more favorable climate for U. S. private investment as the price for stepped-up U. S. aid.

Some leaders of some Latin American republics may find this difficult to swallow. Only recently Venezuela's President Betancourt urged that the U. S. abandon "deification of private enterprise."

The U. S. would like the lion's share of funds to go to some form of construction. But some Latin American representatives to the conference told ENR that some money should be used for more intangible items. One of these would be the bolstering of prices of agricultural products and minerals. Such differences are not expected to present formidable hurdles.

Needs in the Latin American countries vary greatly. The most universally pressing is rural rehabilitation, which has top priority in the program. After that comes housing and community facilities, then education and training.

Even some of the biggest and most advanced Latin American nations have great need for such projects. Brazil, for example, is cited by experts as among the most desperate for rural housing and roads, sanitation and schools. Nor are the big cities beyond development needs. Brazil's Rio de Janiero is short almost every kind of public facility, including water. Buenos Aires, Argentina, has a serious housing shortage. Venezuela's most urgent problem is rural development.

Another phase of the program calls for the U. S. to expand substantially its more traditional economic and industrial project aid. In fact, Mr. Dillon was pressed by several Latin American delegations to reassure them that the social project aid would not supplant regular economic assistance.

Together with the new social development program, U. S. assistance to Latin America, which has been running anywhere from $300-million to $600-million over the past several years, probably will be boosted by at least another $100 million a year.

This type of aid often more directly involves U. S. investment and exports. The Export-Import Bank of Washington, and more recently the State Department's Development Loan Fund, have requirements that their loans be "tied" to U. S. purchases. Industrial project loans also often include private U. S. investment participation.

A third aspect of the new U. S.-Latin American plan is more vague. It calls for a degree of policy planning and control over economic problems and differences between the U. S. and Latin American nations.

Mr. Dillon proposed last week that the Economic and Social Council of the Organization of American States be strengthened to handle this job. Some Latin American leaders would prefer to see a separate body set up similar to the new European Organization for Economic Cooperation and Development.

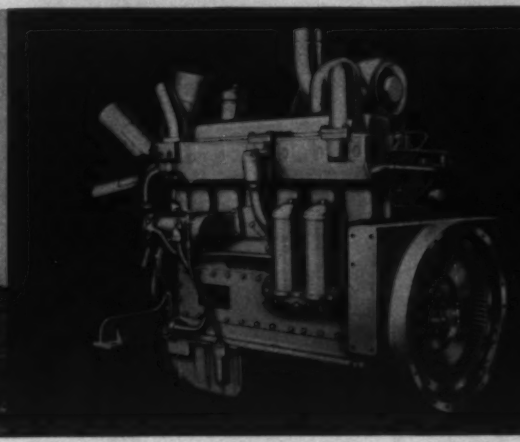
Whatever the instrument, such a move will mean that the U. S. will be asked to liberalize its import restrictions, cooperate in commodity stabilization efforts, and help technically, and possibly financially, Latin American plans for regional trade and industrialization blocks.

This policy-planning and control could become controversial from the U. S. point of view if it pointed toward restrictions against U. S. investment and exports while at the same time aimed for lower U. S. trade barriers. But U. S. officials are determined to keep any such policy group headed toward more liberal goals.

While many details of the whole new program remain to be ironed out, one thing is certain: the basic idea is here to stay. Both U. S. political parties are committed to it, and the results of the November election are likely to affect it only in a matter of degree.

NEW CAT NO. 14 SERIES C MOTOR GRADER

Compact engine plus many other refinements assure top performance, easier servicing, long life



Important changes make up the new Series C No. 14 Motor Grader—big improvements throughout to give you better performance, long life and servicing ease:

NEW COMPACT 150 HP ENGINE The short, rigid block and stress-relieved crankshaft give greater strength and shock resistance. New cylinder head design resists distortion yet has superior cooling characteristics. Large water pump with cast-iron impeller, ceramic seal face, and carbon type seal combined with a 20 per cent increase in radiator capacity improves cooling, lengthens life.

NEW STARTING ENGINE All-weather starting with this new two-cylinder vertical gasoline engine is assured. Replacing the horizontal engine, this design features aluminum pistons and overhead valves for improved performance. Bore is 2.38″, stroke is 2.38″, and compression ratio is 8:1. Over-running clutch in starter pinion prevents damage to starter engine when diesel starts, a year-round starting plus.

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FULL VISIBILITY—operator has unobstructed view of job even while seated.

Now, all Cat Motor Graders feature the compact engine. Like the new No. 14C, the 85 HP No. 112E, the 100 HP No. 112F, and the 115 HP No. 12E are all designed to give you the highest production at the lowest possible cost. Your Caterpillar Dealer can give you the facts and figures. He can prove it both on paper and on your job. Call him today.

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. . . Get Money for the Job

Officers of three companies and a public authority last week got a good look at a certified check for $178,148,229.17, which will pay for construction of the 17.5-mile bridge-tunnel across the mouth of Chesapeake Bay.

While S. E. Liles, Jr. (second from left), president of Tidewater Construction Corp., Norfolk, Va., hefts the check, Lucius J. Kellam (second from right), gives a last reading to the order to contractors to "go ahead." And with those words, George F. Ferris, (left), chairman of Raymond International Inc., New York City, commented "Now we're on our time." After completion of a few more borings, said L. J. Sverdrup, (right), president of Sverdrup & Parcel, Inc., St. Louis consulting engineers, a major start on construction will be made next month.

At that time, the members of the four-company joint venture of Raymond, Tidewater, Merritt-Chapman & Scott Corp. of New York City, and Peter Kiewit Sons' Co. of Omaha, will be at work on the largest construction job awarded this year, and one of the most challenging jobs in several years.

Years have gone into researching for design and construction techniques. One subject alone, or two closely related subjects—weather and wave-tide conditions—is covered in a 3- to 4-in.-thick volume compiled especially for the job. These pages probably will prove the key to successful completion of the job by the specified date—October, 1963.

Contract price is $121.8 million including about $5 million for contingencies, but excluding a $2 million contract to American Bridge Division of U.S. Steel for steel and steel erection.

Down Again

Equipment orders are off, but pickup is coming

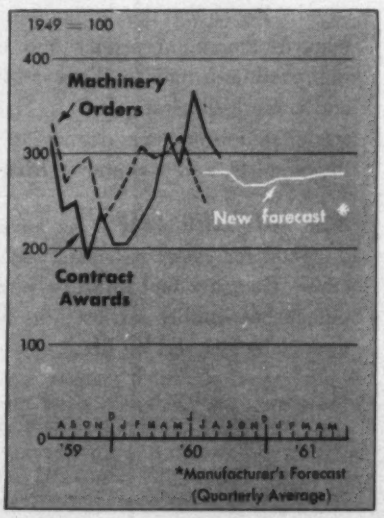
Construction equipment orders fell in July for the second consecutive month. New orders to manufacturers of construction and mining machinery were 11% below June and 23% below May. The drop occurred in the face of a July record for contractors' new business.

The new orders index for July was 245, based on 1949 as 100. This was the poorest for July since 1957, according to the McGraw-Hill Economics Department, which computes the index from reports by cooperating companies—primarily producers of construction and mining machinery. However, orders for their other products also are included.

The equipment orders trend now pulls sharply under the construction contract trend (see chart). This contrasts with late 1958 through early 1960, when orders climbed above the contract trend.

The reversal of form may reflect some "overbuying" for expected new business in 1959. Two factors were responsible for this: heavy purchases of replacement equipment following the 1957-'58 recession in contractors new business, and the effects of the 1959 steel strike. Before the strike, contractors rushed in to buy equipment, fearing that deliveries would be disrupted during a long work stoppage. After they purchased, contracting schedules flowed down when steel supplies ran low.

But judging by the strength of the current boom in contractors' new business, the new orders index probably will return to a closer relationship with the contract trend before next spring.



Meet an expert in strong, light construction Grass, fibers, weed stalks and horsehair don't sound much like building materials, but an oriole can do wonders with them. She weaves them into a sac-shaped nest that's light enough to suspend from thin twigs. Yet the nest is so strong that hurricane winds can't tear it from the branches. ☐ For exceptional strength and lightness in a man-made structure, we suggest USS AmBridge Steel Joists, both standard and long-span. They provide strong, lightweight and economical construction suitable for most any type of roof, ceiling or floor. AmBridge Joists have an underslung, open-web design for maximum headroom, and to accommodate pipe, ducts and conduit in all directions. AmBridge Steel Joists are easy to install. And once in place, they make a safe working platform. Want more information? Write to our Pittsburgh Office for your free copy of a 40-page catalog.

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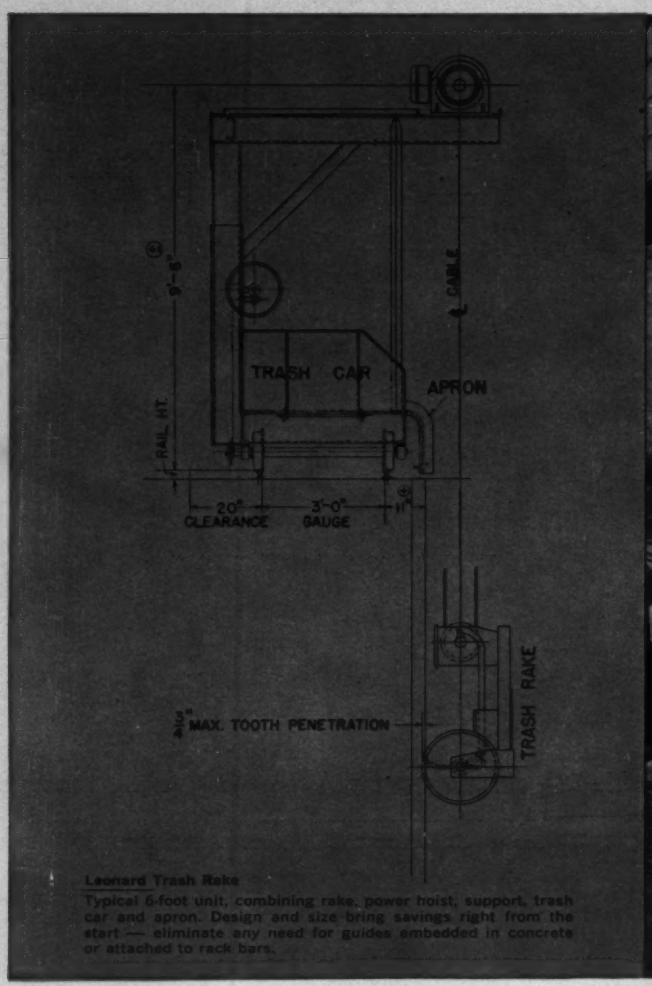

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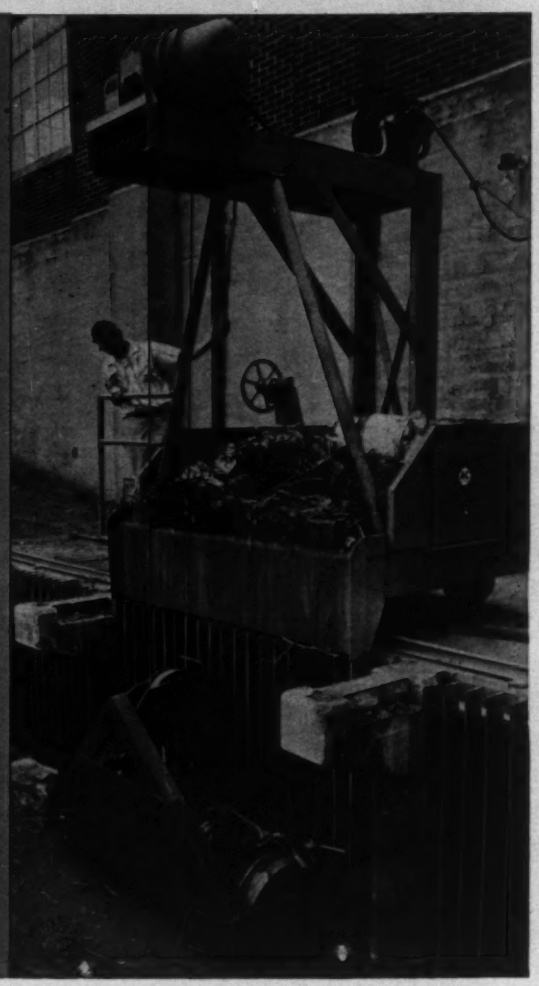
Typical 6-foot unit, combining rake, power hoist, support, trash car and apron. Design and size bring savings right from the start — eliminate any need for guides embedded in concrete or attached to rack bars.



Cleans up costly head losses

. . . rakes-in savings enough to pay for itself!

Here's intake-trash removal so far ahead of hand methods that *"once sold is sold forever!" Leonard* trash rake installations deliver savings both in reduced head loss and labor costs. And they bring a permanent solution to shortages of people to do the job — make trash removal a one-man operation.

Leonard **trash rakes roll right down your existing rack bars whether vertical or inclined. Because no channel guides are needed, they freely ride over stubborn obstructions, dig them loose, scoop trash up to the waiting receptacle or car. Self-dumping units also are available—both log-grapple and regular models.**

***Leonard* is an Allis-Chalmers trademark.**

With Allis-Chalmers trash rakes even the initial investment is low. Width is held to the logical minimum required for adequate handling of trash . . . standard 6- and 8-foot sizes. Larger units special. Your nearby A-C representative has full details. Or write Allis-Chalmers, Hydraulic Division, York, Pa.

A-1307

Engineers Reject AFL-CIO Tie

- **A leading engineering union loses but contests decertification election at Sperry Gyroscope.**
- **If vote is upheld, AFL-CIO may lose. But engineers' search for stronger voice will continue.**

Engineering personnel at Sperry Gyroscope Co. voted last week to decertify Engineers Association, which represents 3,486 engineers, designers and draftsmen. The vote was 1,724 to 1,509. EA plans to contest the election through formal channels this week.

EA is a nationally prominent engineering union. It recently affiliated with the International Union of Electrical Workers, an AFL-CIO union that also represents production and clerical workers at Sperry.

The affiliation may have been one of the factors leading to the union's defeat last week. At least that's the interpretation of spokesmen for both the EA and its insurgent members.

Mineola attorney Harry Rains, who represented the more than 1,000 workers who requested the decertification election, says most of the vote was directed against EA's affiliation with IUE without first submiting the question to a vote of all members of the bargaining unit. The affiliation occurred on a vote of only 60% of the members (ENR July 28, p. 82). Mr. Rains also saw in the vote a "strong feeling that professionalism does not fit in with unions in general."

One of the EA group views the vote as an expression of "fear of big labor." He feels the question of decertification would never have arisen if affiliation with IUE had not taken place. And if it had, he says, the vote would have gone the other way. He also points out, however, that affiliation with IUE was a necessity because EA alone could not exert enough economic pressure to obtain its members' bargaining objectives. Such a failure could have meant EA's extinction when the present contract expires in 1962.

For the time being, at least, EA remains in business as bargaining representative. The union has challenged the election result. That challenge must be disposed of before the results can be certified by the National Labor Relations Board, which ordered and supervised the vote. This could take one to six months.

The objection was made according to EA President Charles Hall, as a result of "reported unfair labor practices." These, he says include management "irregularities" that "materially influenced" the vote.

A collateral development in the union picture is the possible reemergence of another group—Scientists and Engineers Association. This group threatened to intervene in the election, although it never did so formally (ENR Aug. 18, p. 148).

Now there is speculation that SEA may seek NLRB certification if EA is finally decertified, or challenge EA should the election results be voided. SEA has been talking in terms of a super-professional union.

Meanwhile, there are strong indications that EA itself may try to reorganize, regardless of the result of the present contest. Doubt has been expressed that the present bargaining unit is an "appropriate" one. Revisions could be along the lines of two separate internal structures—one professional and one nonprofessional. Should that occur, the 12-month legal bar against recertification of EA, if it loses now, would presumably not apply.

Under EA's present certification, the bargaining unit includes professional engineers, engineering aides, designers, draftsmen, chemists, metallurgists, engineering writers and others. Of these, 2,350 have the title of "engineer" and practically all of them are considered professionals. EA claims a membership of 1,600 and puts the percentage of professional membership at 65.

The decertification committee that brought about the election has not been talking entirely in terms of no union at all. In arguing against the IUE affiliation, it expressed fear that "the combination of all three IUE locals (now at Sperry) would be used to force an agency shop contract that would require all engineering employees to pay dues for representation whether they wanted to or not." And they felt that professional engineers, swallowed up in the IUE, would be "forced to accept union goals inconsistent with their own best interests."

The committee also argued that decertification "would place the union on the same footing as other possible representative groups and clear a way for trial of better approaches in engineering relations." The election results, it said, demonstrate "the deep desire of engineers in industry to find a truly dignified and professional framework for their situation in large-scale employment. The way is now clear at Sperry for such approaches and we expect to pursue them."

Another factor in the total picture is IUE's expected approval this week of a national engineering council for its engineering affiliates.

The closeness of last week's decertification vote, an EA determination to stay in business and the apparent restlessness among Sperry workers seems to reflect a fluid situation that turns the vote, regardless of its outcome, into "no final decision."

Interim attitude and actions of management may be a determining factor. Sperry can, by what it does, in a very real sense invite or discourage unionization.

One of its problems, if EA is decertified, is to decide how much effect to give to the present labor contract, which does not expire until 1962. The NLRB, according to one of its attorneys, makes no decision on the validity or enforceability of a contract after decertification.

Sperry President Carl. A. Frische, before the election, pledged Sperry's management, regardless of the outcome of this election, to "work toward continued improvement of the working conditions and the economic status of engineering employees." He assured Sperry engineers that "no company benefits which are currently enjoyed would be withdrawn or curtailed."

After the election, he said: "We believe the members of our engineering staff will benefit from this decision. Certainly the company welcomes this opportunity to develop among its technical staff even higher levels of satisfaction with their work. We hope, as a result of this election, that we will be in a position to give engineers greater opportunity to perform their function of sharing managerial responsibility which is so important to a company like Sperry."

Learn a Trade and Earn $10,500 a Year

How much the public will continue to pay in labor costs and how to engage in effective collective bargaining became critical questions in New York City last week when settlements were reached with two of the building trades, ending all but one of the construction industry's long and costly strikes.

By July 1, 1962, metropolitan steamfitters and asbestos workers, when steadily employed, will be earning just over $10,500 a year in straight-time pay and fringe benefits under their new, three-year, 80- and 81-cent labor contracts.

A day's pay (seven hours) for a steamfitter will be $40.95, representing $35 in wages and $5.95 in fringe benefits. For asbestos worker it will be $36.75 in wages and $3.64 in fringes, making a total of $40.39 a day.

Contractors report that they achieved nothing in either settlement and obtained no compensating concessions.

Both strikes began on July 1. The resulting idleness seriously affected construction activity and caused the loss of millions of dollars in wages, taxes, rents and profits. In the case of the steamfitters, union refusal to accept an 80-cent offer on August 5 means that the 4,000 union members paid over $3 million in lost wages and fringe benefits for a one-cent gain.

Still on strike as of the end of last week were the elevator constructors, whose absence continued to cripple construction activity in varying degrees.

Result, despite the absence of pickets, is that the unions have been able to shut down construction work step by step, trade by trade. And some of the local contractors feel the time has come for a radical revision in bargaining procedures—simultaneous and closely coordinated negotiation with all trades, or joint negotiation of a master labor agreement for all trades. At present, each trade association negotiates independently with its unions within the framework of the Building Trades Employers Association, to which they belong.

Stickiest of the current negotiations was with the steamfitters. Two of the stumbling blocks were contractor insistence on the right to use pipe cutting and threading machines on the job and elimination of the work rule that requires putting two men on every job, however small. The contractors lost in both instances.

In July newspaper advertisements, the Mechanical Contractors Association of New York called the work rules "featherbedding" that "costs the public far more than is right for every project."

The association claims that most of the steamfitters, who enjoy what is called an "artificial" manpower shortage and who generally find steady employment, earned an average of $8,500 a year before the strike, with some getting $17,000 a year.

This put them, it said, in the highest bracket of hourly workers "anywhere in the world."

One of the asbestos contractors, on the other hand, said the work practice issue did not exist in their negotiations and that wasteful work practices are not a problem with them.

Left unanswered by the New York City strikes is the ever-present question of how high building costs can go. The mechanical contractors, in one letter to the steamfitters during the strike, said: "Concern over inflation also involves the cost of building in New York City. If this cost goes much higher, we know many projects now contemplated will be abandoned, or be shifted to other parts of the country or be sharply reduced in scope."

The new steamfitter contract pushes the old scale of $4.50 to $5.00 in three installments of 15, 15 and 20 cents. It retains the old 4% welfare contribution, increases the pension and vacation payments to 5% each and adds 10 cents an hour for a "security" fund, the precise purpose of which is still to be determined. The old 1% education payment was dropped because the failure to take in new union members via apprenticeship in 1958 and 1959 allowed the fund to accumulate about $500,000 a year.

The asbestos workers, who were getting $4.60 an hour, will get five raises (15, 10, 10, 10 and 20 cents) between now and July 1, 1962, when their scale will be $5.25.

Labor Calls $3 an Hour Just Adequate

What is an adequate wage today?

Not less than $3 an hour is the answer given last week by one of the AFL-CIO's vice presidents, Al Hayes. And that assumes, he said, that the worker is steadily employed, getting paid for a full, 40-hour week every week.

Mr. Hayes, in a Labor Day speech, based his estimate of income needs on a U.S. Labor Department finding of last month that a married, urban worker (aged 38) with two children (aged 8 and 13) must earn about $6,000 a year to live modestly but adequately.

That is the amount of income needed, the department explained, to maintain such a family "at a level of adequate living, according to prevailing standards of what is needed for health, efficiency, the nurture of children, and for participation in social and community activities."

The department said the cost of the budget needed to finance such a standard of living for the type of family it considered varies among the 20 cities surveyed, ranging from $5,370 in Houston to $6,567 in Chicago.

Labor's goal of at least $3 an hour for all workers means a steady income of not less than $120 a week. For purposes of comparison, the average weekly earnings of factory workers was $89.24 last year.

Construction workers, with relatively high average hourly earnings of $3.12, averaged $114.82 a week. A minimum wage of $1.25 ($50 a week) would produce less than half the income needed for a "modest but adequate" level of living for the urban, four-member family.

Mr. Hayes conceded that many skilled workers are now able to command $6,000 a year. And the Labor Department estimated that the average income of the families to whom its $6,000 budget applies is 15 to 20% above the cost of the budget.

But such statistics and labor's progress so far should not obscure the fact, Mr. Hayes said, that there are still eight million families with annual incomes of less than $2,500.

The AFL-CIO claims that over 20% of all Americans, or some 40 million persons, still live close to the poverty line, or below it, with over five million living on incomes under $1,500.

The labor message is that the work of organized labor has just begun and that unions, through organization, collective bargaining and legislative action, must continue to push for more economic security and higher living standards.

Labor in Brief . . .

• **Employment up**—The government last week reported a rise of 53,000 in the number of employed construction workers, giving the industry an August employment figure of 3,184,000. This is 83,000 above a year ago. Total employment dropped to 68.3 million—still a record for August—and the rate of unemployment rose to 5.9%.

• **Insiders want in**—A Norfolk, Va., local of the operating engineers has picketed work on the second Portsmouth-Plymouth Tunnel. It contends the tunnel builder is not hiring local workers.

• **Wage protection**—The Washington, D. C., Building and Construction Trades Council is urging customers to refuse to patronize stores whose buildings were erected by nonunion contractors. Leaflets containing the appeal have been distributed at Safeway stores in the Washington area accusing Safeway of undermining "the living standards of construction workers" by having stores erected by nonunion construction workers.

• **Strike continues**—A strike of 1,500 pipefitters has stalled $50 million worth of construction in the Texas Gulf Coast area. Union seeks a 17.5-cent pay boost. Present scale: $3.80.

• **Top-level adviser**—Formation by the federal government of a permanent National Council of Labor-Management Advisers, representing labor, management and the public, has been proposed by Arthur Goldberg, special counsel to the AFL-CIO. Its purpose: To "advise the President in the development of constructive policies and programs" for industrial peace, economic growth and prosperity.

• **Minimum wage**—The Arkansas State Building and Construction Trades Council has endorsed a measure initiated by the Arkansas State AFL-CIO to raise the state minimum wage to $1.00 and to cut the work week to 40 hours over a three-year period. The measure, designed to promote the state's economic growth, will be on the November state ballot.

• **Union drive**—A three-week strike affecting $70 million worth of home and apartment construction work in Toronto ended last month after the unionization of 6,000 European immigrant workers, mostly Italian. Unions participating in the organization of the workers were plasterers, carpenters, bricklayers, painters, operating engineers and laborers. The unions said many immigrants were being paid only half union scale.

Situs Picketing Drive Begins

The AFL-CIO Building and Construction Trades Department has called on the 630 state and local building trades councils to begin immediately a new drive to secure enactment of the situs picketing bill when the 87th Congress convenes in January.

Department President C. J. Haggerty called the failure of the last Congress to adopt the bill a "defeat for all, in and out of Congress, who have fought to protect the standards of wages, hours and working conditions established by the trade unions in the building and construction industry."

"Obstructive tactics" prevented majorities in both houses of Congress from adopting the bill, Mr. Haggerty charged, although the measure was formally supported by both parties.

He has recommended to the building trades unions a three-point program to overcome opposition to the bill:

Active participation by all of labor in the election of capable members of the House and Senate.

Election of a President who will utilize his powers and permit majority rule in the legisative process.

Congressional removal of the obstructive devices that prevent majority rule.

The opponents of the bill, Mr. Haggerty said, "feared the judgment of the majority of the House and Senate on the merits of the issue. Their supporters utilized procedural machinery of the House and Senate which a few strategically placed men can operate to frustrate the will of the majority."

Among the obstructionists mentioned by Mr. Haggerty were members of the House Rules Committee and Senators Everett Dirksen (R., Ill.) and Barry Goldwater (R., Ariz.).

The situs picketing bill is essential, Mr. Haggerty said, to give the building trades relief from the "inequitable restrictions on picketing which are imposed by the Taft-Hartley Act and tightened by the Landrum-Griffin Act."

Pensions Vulnerable

Disclosures Act offers no protection says Mitchell

Labor Secretary James P. Mitchell has charged that the Welfare and Pension Plans Disclosure Act is a waste of the taxpayers' money and only "a shameful illusion" of adequate protection.

In a report to Congress on the law's first 18 months of operation, Secretary Mitchell said the act provides "no persuasive deterrent to those who wish to ignore its provisions, or to manipulate or embezzle funds."

A substantial amount of confusion and noncompliance with the law is still prevalent, he reported, despite the annual expenditure of half a million dollars by the Labor Department and additional millions by those required by the law to file reports on welfare and pension plans.

Expressing "grave doubts as to the wisdom of retaining so weak a law on the statute books," Mr. Mitchell called for "prompt" amendments to convert a relatively useless law into a meaningful one.

The self-policing, self-enforcing law was passed by Congress in 1958, after McClellan Committee disclosures, to protect those with investments in employee welfare and pension plans.

The law's two major shortcomings, Mr. Mitchell said, are its failure to give the Secretary of Labor authority to interpret its provisions and power to investigate and enforce compliance.

An indication of the confusion the law has generated, he noted, is revealed by these statistics: The department has had over 11,800 mail inquiries, 5,500 phone calls and 450 personal visits dealing with substantive aspects of the law. The total of plan descriptions received is 142,500—far short of the number believed to fall within the scope of the law. The number of plan amendments filed is "thousands" under what it should be. Some 15,000 to 20,000 annual reports are delinquent and thousands of those submitted are not in order. The department has sent out some 24,000 deficiency or delinquency letters—many with no results at all.

Mr. Mitchell has asked Congress to authorize the Secretary of Labor to make "authoritative interpretations" of the law and to give him effective investigatory and enforcement powers. Included in his recommendations are the power of subpoena and criminal penalties for flagrant abuses.

The law, with a few exceptions, requires administrators of such plans to file descriptions of the plans and to file annual reports on the operations of the plans.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: September 30, 1960

Round Valley Reservoir Project Relocated Lebanon-Stanton Road

CONTRACT RV-3

SEALED BIDS will be received from bidders by the Department of Conservation and Economic Development at its office, first floor, 205 West State Street, Trenton, N. J., at 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M. Eastern Standard Time) on Friday, September 30, 1960, and will be opened and read immediately thereafter, for the grading of approximately 2.55 miles of new relocated road, the paving of approximately 2.22 miles of the above with bituminous macadam and other appurtenant work, all as set forth in the specifications. The new relocated road is a portion of the existing Lebanon-Stanton road beginning at McPherson's Corners and running in a northerly direction west of the proposed Round Valley Reservoir to a point west of the proposed dike. The work is located south of the Borough of Lebanon in the Township of Clinton, Hunterdon County, N. J. Bids will be accepted only from bidders prequalified with the N. J. State Highway Department in accordance with R. S. 52:35.

The bid, accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in an amount of not less than 5 percent of the bid, an Agreement of Surety, an Affidavit of Non-Collusion, an Appointment of Agent by Non-resident Bidders and a Revised Financial Statement and Plan and Equipment Statement on prequalification forms, must be enclosed and sealed in an envelope provided for that purpose by the Department. Bids not so submitted will be considered informal and will be rejected. Bids must be delivered at the above place on or before the hour named, as no bids will be accepted after the hour specified.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the office of the Chief Construction Engineer of the Bureau of Design and Construction of the Division of Water Policy and Supply of the Department of Conservation and Economic Development, 219 West State Street, Trenton, N. J., upon application in person or by mail, by depositing the sum of $25.00 for each set of pamphlets, this deposit to be refunded to the bidders upon return of such documents in good condition within 30 days after the award of the contract. Prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Construction Engineer.

The Commissioner reserves the right to select the bid the acceptance of which will be most advantageous to the State, price and other factors considered. Any and all bids may be rejected when the Commissioner determines that it is in the public interest so to do.

Salvatore A. Bontempo
Commissioner of Conservation and Economic Development

Bids: October 3, 1960

Spruce Run Reservoir Project Culverts and Bridge on Relocated Road

CONTRACT SR-2

SEALED BIDS will be received from bidders by the Department of Conservation and Economic Development at its office, first floor, 205 West State Street, Trenton, N. J., at 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M. Eastern Standard Time) on Monday, October 3, 1960, and will be opened and read immediately thereafter, for the construction of two reinforced concrete box culverts with clear spans of 10 and 15 feet, respectively, a reinforced concrete bridge across Spruce Run with two spans of 30-feet each and channel excavations, all as set forth in the specifications. The culverts and bridge are located on the proposed relocated Spruce Run road, located in the Townships of Lebanon and Union, Hunterdon County, N. J. Bids will be accepted only from bidders prequalified with the N. J. State Highway Department in accordance with R. S. 52:35.

The bid, accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in an amount of not less than 5 percent of the bid, an Agreement of Surety, an Affidavit of Non-Collusion, an Appointment of Agent by Non-resident Bidders and a Revised Financial Statement and Plan and Equipment Statement on prequalification forms, must be enclosed and sealed in an envelope provided for that purpose by the Department. Bids not so submitted will be considered informal and will be rejected. Bids must be delivered at the above place on or before the hour named, as no bids will be accepted after the hour specified.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the office of the Chief Construction Engineer of the Bureau of Design and Construction of the Division of Water Policy and Supply of the Department of Conservation and Economic Development, 219 West State Street, Trenton, N. J., upon application in person or by mail, by depositing the sum of $10.00 for each set of pamphlets, this deposit to be refunded to the bidders upon return of such documents in good condition within 30 days after the award of the contract. Prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Construction Engineer.

The Commissioner reserves the right to select the bid the acceptance of which will be most advantageous to the State, price and other factors considered. Any and all bids may be rejected when the Commissioner determines that it is in the public interest so to do.

Salvatore A. Bontempo
Commissioner of Conservation and Economic Development

Bids: See advertisement:

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract S91-110.001 — Port Authority Building—6th Floor South Side Alteration to Room 607—No deposit required
Bids will be received until 2:30 P.M. on Thursday, September 29, 1960.

Contract PN-140.032 — Port Newark — Building No. 143— Floor Rehabilitation—No deposit required
Bids will be received until 2:30 P.M. on Thursday, September 22, 1960.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, September 15, 1960

Read the Official Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

OFFICIAL PROPOSALS

Bids: September 21, 1960

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Canal Law Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern time, on the 21st day of September 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany, New York						
Essex, Greene, Rensselaer, Saratoga & Schenectady	FARDC 60-1	Permanent Radar Detector Traffic Counter Stations on S.H. 891, 8384, 610, 5314 & C.R. 30 Project No. HPS-1(17)-A1	....	Installing 5 Radar Detector Traffic Counter Stations	$450 Plans $5	$8,300
Essex (Rte. 73)	RC 60-148	Euba Mills-Keene Valley, Pt. 1, S.H. 8439	4.74	Cable Guide Railing	$2,300 Plans $5	39,000
Greene (Rte. 23A)	RC 60-157	Tannersville-Haines Falls, S. H. 1830	0.15	Asphalt Conc.=0.13 Mi.; Misc Work=0.20 Mi.	$6,500 Plans $5	112,000
Rensselaer & Saratoga (Rte. 4)	C 60-20 RC 60-166	Troy-Waterford Br. Vill. of Waterford: Third St. & East Broad St., S.H. 9364; City of Troy: Art. Highway (125th St.)	0.14	3 Span-Conc. Box Culv.=38' Repairs to Substructure & Painting Superstruc.	$12,000 Plans $5	218,000
Saratoga (Int. Tr. Rte. 87)	FISH 60-8	Interstate Rte. 502; Malta to Saratoga Springs Project I-87-3(35); U-437(4)	7.89 (10.39 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' & Var.=12.43 Mi.; Misc. Work=0.11 Mi.; Asphalt Conc. 5.74 Mi.: 8 Hg Sep. 7 Prestressed Conc. 368.2'; 142.0'; 142.0'; 142.2'; 139.2'; 382.0'; 330.2'; 1 Comp. Beam 328.8'; 3 Bridges, Prestressed 139.5' and 2 @ 142.0'.	$535,000 Plans $10	9,762,000
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Fulton (Rte. 10)	R.C. 60-151	Stone Arabia-Ephratah, Pt. 2, S.H. 1597; Ephratah-Keeks Ctr., Pt. 2, S.H. 620; Ephratah-Caroga, S.H. 1686	4.71	Asphalt Conc., Type 2A	$8,000 Plans $5	134,000
Fulton (Rte. 10)	R.C. 60-150	Caroga Creek-Canada Lake, S.H. 9039 Canada Lake-Arietis-Piseco, Pt. 1, S.H. 1739	3.09	Asphalt Conc. Type 2A	$6,000 Plans $5	112,000
Hamilton (Rte. 28)	R.C. 60-156	Blue Mountain Lake-Indian Lake, Pts. 1 & 2, S.H. 5704, 5704A; Indian Lake-County Line, S.H. 1100	11.31	Asphalt Conc., Type 1A	$47,000 Plans $5	862,000
Herkimer (Rte. 28)	R.C. 60-149	Columbia-Mohawk, S.H. 472	3.84	Asphalt Conc. Type 1A	$9,000 Plans $5	155,000
Herkimer, Montgomery & Oneida	FARDC 60-2	Permanent Radar Detector Traf. Counter Stations on S.H. 8012. 5028, 5346 and in the City of Utica Project HPS-1(17)-A2	....	Installing 4 Radar Detector Traffic Counter Stations	$300 Plans $5	5,800
Montgomery	M 60-8	Erie Canal, Lock 12-E, Tribes Hill	....	Cleaning and Painting Movable Dam 8	$1,500 Plans $5	29,000
Oneida (Rte. 69)	C 60-19	City of Rome: E. Whitesboro St. Arterial-Fac 58-7	0.46	Chain Link Fencing 6' High	$600 Plans $5	11,000
Oneida (Rte. 233)	R.C. 60-158	Franklin Springs-Kirkland, S.H. 5442; Kirkland Rome, S.H. 8246	0.86	Asphalt Conc., Type 2A=0.79 Mi. Misc. Work=0.07 Mi.	$12,000 Plans $5	213,000
Oneida (Rtes. 365, 26)	R.C. 60-144	Rome Roads, S.H. 564 C.A. Canal Bridge No. E-55	....	Cleaning & Painting Thru Truss 180' Span	$400 Plans $5	7,000
DISTRICT No. 3, Earl E. Towlson, District Engineer, 333 E. Washington Street, Syracuse, New York						
Onondaga, Oswego & Wayne	FARDC 60-3	Permanent Radar Detector Traffic Counter Stations on S.H. 5016, 429, 1516 and in the City of Oswego Project HPS-1(17)-A3	....	Installing 4 Radar Detector Traffic Counter Stations	$400 Plans $5	7,500
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe (Rtes. 259, 261)	R.C. 60-153	W. Greece-Monitou Beach, S.H. 1281; Hilton Vill., S.H. 851	....	Rehabilitation of 3 Plate Girder Bridges	$3,000 Plans $5	53,000
Monroe, Orleans (Rte. 272)	R.C. 60-161	County Line, S.H. 398 Monroe-Orleans County Line, S.H. 588	5.08	Asphalt Conc.=5.05 Mi. Misc. Work=0.03 Mi.	$16,000 Plans $5	282,000
Ontario (Rte. 21)	R.C. 60-160	Cheshire-McJannetts Hill, S.H. 639; Bristol Springs-Cheshire, Pt. 1, S.H. 8156	6.07	Asphalt Conc.=6.02 Mi. Misc. Work=0.05 Mi.	$50,000 Plans $5	943,000
Ontario (Rte. 88)	R.C. 60-147	Canandaigua-Orleans, S.H. 1278	0.25 (0.08 Acc.)	Asphalt Conc. Type 1A=0.24 Mi.; Double Surf. Treatment=0.08 Mi.; Misc. Work=0.01 Mi.; 1 Bridge-Comp. I-Beam-60' Span	$8,000 Plans $5	148,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Erie (Rte. 5)	FAC 60-12	City of Buffalo: Fuhrmann Blvd. Art. Highway (Tift Street to Buffalo Skyway) (Contract 1) Project U-750(21)	1.69 (1.14 Acc.)	Grading and Drainage=1.49 Mi.; Asph Conc.; Type 2A (Acc.)=1.14 Mi.; Misc. Work=0.20 Mi.	$70,000 Plans $5	1,270,000
Erie (Rte. 188)	FARC 60-154 FASS 60-13 FASSRC 60-14	Gardenville-Williamsville, Pt. 2, S.H. 1626; Walden Ave., C.R. 244; Walden Ave.-Ellicott Road, C.R. 318, FASS 52-13. Project U-1080(5); S-380(3)	3.22	Asph. Concrete=2.57 Mi.; 9" Cem. Conc.—24' Widening=0.40 Mi.; Miscellaneous Work=0.25 Mi.	$43,000 Plans $5	835,000
Niagara	FASH 60-11 FARC 60-159	Hyde Park Boulevard, S.H. 58-21; Hyde Park Boulevard Extension. Project U-461(12)	0.31	Asphalt Conc. Type 2A=0.27 Mi. Misc. Work=0.04 Mi.	$9,000 Plans $5	157,000
DISTRICT No. 6, William J. Dennis, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegany	FASS 60-12	Scio-Vandermark Creek Road, C.R. No. 10 Project No. S-789(5)	0.34	Asphalt Concrete Comp. I-Beam Bridges, 2 Spans; Total 164.0'	$11,000 Plans $5	190,000
DISTRICT No. 7, Robert W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton (Int. Tr. Rte. 87)	FISH 60-10	Int. Rte. 502, Section 7D-1 (Miner Farm Road to Ridge Road) Project I-87-4(8)	5.42 (0.39 Acc.)	Asphalt Conc. Type 1A=5.79 Mi.; Misc. Work=0.02 Mi.; 1 Hgs Prestressed Conc Beam, 7 Spans—Total 370.0'; 2 Reinf Conc. Twin Box Culv. Each 2 @ 12'	$170,000 Plans $5	2,895,000
DISTRICT No. 8, Kurt G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Columbia, Dutchess, Orange, Ulster & Westchester	FARDC 60-4	Permanent Radar Detector Traf. Counter Stations on S.H. 762, 135, 537, 453, 8256, 8408, 53-15, 308, 231, 5372, 1456, City of Poughkeepsie and on the Hutchinson River Parkway. Project HPS-1(17)-A8	....	Installing 13 Radar Detector Traffic Counter Stations	$1,000 Plans $5	18,000
Orange (Rte. 17)	R.C. 60-155	Tuxedo-Harriman, Pt. 1, S.H. 8258	2.25	Asphalt Concrete	$29,000 Plans $5	524,000
Orange (Rte. 84)	R.C. 60-152	Slate Hill-Unionville, S.H. 160	0.28	Asphalt Concrete Comp. I-Beam-2 Spans @ 60' Each	$12,000 Plans $5	202,000
Rockland (Rte. 303)	FARC 60-11	New Jersey State Line-Congers, Pt. 1, S.H. 1898; New Jersey St. Line-Congers, Pt. 2, S.H. 8448 Project U-528(8)	1.19 (0.50 Acc.)	9" Cem. Conc. Pavt. 2 @ 24' & Var.=1.48 Mi.; Asphalt Conc.=0.16 Mi.; Misc. Work=0.05 Mi.	$43,000 Plans $5	781,000
DISTRICT No. 9, Joseph C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Sullivan	FARDC 60-5	Permanent Radar Traffic Counter Station on County Road 53. Project HPS-1(17)-A9	....	Installing a Radar Detector Traffic Counter Station	$70 Plans $5	1,350

(Continued on following page)

OFFICIAL PROPOSALS

OFFICIAL PROPOSALS

OFFICIAL PROPOSALS

(Continued from preceding page)

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 10, AUSTIN M. SARR, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
New York & Bronx (Int. Tr. Rte. 95)	FICBE 60-3	Interst. Route Conn. 511; Cross Bronx Expressway Contract 1B, (Alexander Hamilton Bridge Superstructure) Project I-95-1(40)	0.29	Alexander Hamilton Bridge Superstructure	$310,000 Plans $5	5,639,000
Nassau & Queens	FARC 60-164	Jericho Turnpike Pt. 1, Jamaica Ave., S.H. 1831; Jericho Turnpike, Pt. 2, (Jamaica Ave.), S.H. 1940; Jericho Turnpike, S.H. 9020; Jericho Turnpike-Floral Park Vill. S.H. 60-20. Project U-1000(7)	2.35	Asphalt Concrete = 1.99 Mi. Misc. Work = 0.36 Mi.	$150,000 Plans $5	2,771,000
Queens (Int. Tr. Rtes 78 & 495)	FICE 60-2 FIHHE 60-6	Int. Rte. Conn. 513, Clearview Expressway (73rd. Ave. to Willets Point Blvd.); Int Rte. Conn. 514, Horace Hardin Expressway, Sec. 2 (190th St. to Oceania St.) Project I-78-1(52); I-495-1(43)	4.72	Roadside Development	$20,000 Plans $5	353,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal. Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN

SUPT. OF PUBLIC WORKS

Bids: September 21, 1960

Channel Improvements Contract CD 60-1

NOTICE TO BIDDERS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Building Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T., on September 21, 1960 by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Gov. Alfred E. Smith State Office Building, Albany, New York for:

Contract CD 60-1 for
Channel Improvements, Deepening Chadakoin River (Chautauqua Lake Outlet)
City of Jamestown, Chautauqua County, New York

Engineer's Estimate for CD 60-1 is $25,000. Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, New York.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract CD 60-1 may be examined and obtained at the office of Mr. E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo 2, New York.

The deposit for Plans and Proposal Forms for Contract CD 60-1 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; a partial refund for all othe sets in good condition, similar period, will be made.

Proposals for Contract CD 60-1 must be submitted in a separate, sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $1,300. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Building Law and Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

J. BURCH McMORRAN

SUPERINTENDENT OF PUBLIC WORKS

Bids: September 21, 1960.

Beach Protection Contract B. P. 60-77

NOTICE TO BIDDERS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, NEW YORK—Pursuant to the provisions of the Building Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T., on September 21, 1960 by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Gov. Alfred E. Smith State Office Building, Albany, New York for:

Contract B.P. 60-77 for
Beach Protection (Four Stone Groins) at Far Rockaway, The Rockaways, City of New York, Queens County, New York

Engineer's Estimate for B.P. 60-77 is $870,000. Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, New York.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract B.P. 60-77 may be examined and obtained at the office of Mr. Austin M. Sarr, District Engineer, 325 West Main Street, Babylon, L. I., New York.

The deposit for Plans and Proposal Forms for Contract B.P. 60-77 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; a partial refund for all other sets in good condition, similar period, will be made.

Proposals for Contract B.P. 60-77 must be submitted in a separate, sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $45,000. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Building Law and Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

J. BURCH McMORRAN

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P-5250, Engineering News-Record
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Experienced on industrial and commercial building construction. Prefer engineering background. Location Southeastern States. Send complete resume and reference first letter.

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Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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• POSITIONS VACANT

Field Supervisor. Large established midwest consulting firm has permanent position in building construction supervision for thoroughly qualified and experienced man. Mechanical engineer preferred. Moving expenses paid. Send complete resume to P-4833, Engineering News-Record.

Bridge and Highway Supt. for well established Mid-west contractor. Applicant must be capable of handling complete phases of joint venture highway work and must have a detailed knowledge of bridge formwork including wet piers. Excellent opportunity and salary for qualified man. Engineering background preferred. Please reply giving experience record, salary desired, etc. P-5207, Engineering News-Record.

Engineer, R & D, graduate CE or ME, age 25-40. Work includes technical writing, consultation, research and development relating to the curing of concrete products with steam at high pressure. Permanent position. Applicants furnish photo and complete resume including salary desired in first letter. Location Washington, D. C. P-5219, Eng. News-Record.

Superintendent—Heavy construction. Graduate Engineer. Experienced in heavy concrete. Permanent position. P-5203, Engineering News-Record.

Building Supt. for well established General Contractor operating in three state Mid-west area. Excellent opportunity for superintendent thoroughly grounded in form work and management of large sized institutional and commercial work. Please reply giving experience record, salary desired, etc. P-5201, Engineering News-Record.

Assistant To City Engineer. Salary to $6,588. Fringe benefits. Opportunity for varied design and construction experience. Large city planning, street, sewer and expressway programs under way. Write City Manager, Zanesville, Ohio before November 1.

Engineer, Division of Inspections. Prefer young graduate engineer with administrative ability to take complete charge of rapidly expanding division. Knowledge of building, plumbing and electrical codes desirable. Starting salary $6500. Submit complete personal data to Mr. W. G. Brady, Town Hall, Fairfax, Virginia.

Estimator—Midwestern construction and engineering firm has opening for qualified heavy construction estimator. Engineering degree necessary. Permanent position for right man. Salary commensurate with ability. P-5165, Engineering News-Record.

Draftsmen, Structural-Experienced checkers and detailers of structural steel shop drawings. Permanent position. Fink and Zwecker Co., 1100 Crescent Ave., N.E., Atlanta 9, Ga.

Project Engineer for large Capehart Housing Project in Missouri. Age to 35. Please send resume and salary requirements to P-5270, Engineering News-Record.

Permanent Position: Structural engineer with Ph.D. or M.S. degree from well recognized engineering school. Well grounded in the Theory of Elasticity to handle complex indeterminate structures. Excellent living conditions, good future for young and responsible engineer. Submit Graduate School credits. Location North Carolina. P-5231, Engineering News-Record.

Plant superintendent required—experienced in prestressed precast concrete. Steady employment. Fenrich Prestressed Concrete, 1-340-58 Ave., Edmonton, Alberta, Canada.

Sales Engineer for wellpoint dewatering in various sections of the country. Engineering background, civil preferred. Alternate at least 5 years experience in supervisory capacity in heavy construction work. Excellent opportunity. State age, education experience, marital status. P-5241, Engineering News-Record.

Project Superintendent for large Capehart Housing Project in Missouri. This position requires a man of outstanding organizational and supervisory ability. Please send resume and salary requirements to P-5281, Engineering News-Record.

Estimator—For heavy construction sewage and water treatment plants and building construction. Please send complete information on experience, references, salary required and availability. Carl E. Widell & Son, 1200 Haddonfield Road, Merchantville 10, N. J.

Superintendent of Streets: Graduation from a standard high school or trade school, and preferably supplemented with courses or experience in civil engineering, and extensive experience in public works construction and maintenance. Salary range $6786 to $8034, dependent upon qualifications. Personnel Director, City Hall, City of East Providence, R. I.

Estimator and Project Engineer. Should have a minimum of four years experience expediting, purchasing, and estimating commercial and industrial building construction work. Design and field experience helpful. Permanent position with established General Contractor in central Connecticut. P-5239, Engineering News-Record.

Young aggressive company needs Engineer-Estimator capable of estimating and bidding from plans and specifications, plumbing, heating, sheet metal and air conditioning jobs. Must be capable of layout and design of mechanical work, and capable of dealing with the public, and negotiating contracts and change orders. Good salary and stock purchase option available for right man. P-5230, Engineering News-Record.

• POSITIONS WANTED

Chief Estimator-Project Manager — Fully qualified to handle work from bidding stage to completion. Best of references. Building Construction, Heavy Construction, Sewage and Water Treatment Plants PW-5011, Engineering News-Record.

Land Development Engr.—Heavy experience in design and construction of sub divisions including land use, utilities, roads, golf courses, etc. seeks administrative position with developer or contractor. Recently returned from South America and am free to relocate. Age: 33, married. PW-5115, Engineering News-Record.

Engineering Executive. Wide industrial, chemical and civil experience; all phases administration and management. Organize and direct large design jobs or work in consulting and exec. asst. capacities. Proposals, reports, contracts, liaison, trouble shooting. P.E. in 5 States. PW-4725, Engineering News-Record.

Superintendent-Engineer, experienced in strip mining and earth moving. Now employed, available soon. PW-5262, Engineering News-Record.

• POSITIONS WANTED

Construction Engineer, Contract Administrator—BSCE—age 25—four years experience in engineering construction—supervision, inspection, contract administration—prefer foreign assignment—military obligations completed—available 1 November. PW-5163, Engineering News-Record.

Civil—Structural Engineer, degree. 15 years design experience in all types of structures. Reinforced concrete, structural steel, prestressed concrete. Desire a position. Available at a notice. PW-5146, Engineering News-Record.

Executive: Excellent legal-construction background, exp. all phases construction field & central office, administrator, mgr, atty, govt contracts, employed, female. PW-5145, Engineering News-Record.

Superintendent 41, BSCE., Reg. Sound experience in general construction, estimating and layout, office work. Want opportunity with medium size progressive organization. PW-5157, Engineering News-Record.

Structural Engineer—Graduate, Registered, 8 years experience fabrication and design structural steel desires responsible position with fabricator. PW-5202, Eng. News-Record.

Construction Manager Registered Professional Engineer with intimate knowledge and acquainted in various foreign countries, 30 years experience responsible charge large construction projects. Can handle job start to completion also engineering inspection. Desires connection where this type experience needed in foreign construction field. PW-5224, Engineering News-Record.

Proj. Mgr. or Heavy Const. Sup't. 14 yrs. exp. road & bridge const. Engineering, estimating, & supervision. Incl. 4 yrs. operating self-owned bridge constr. co. $500,000. annual gross. Avail. immed. Will relocate. PW-5195, Engineering News-Record.

Young construction man seeks position with contractor in Michigan or N. Ohio area. Age 29, BSCE. Desire more opportunity for advancement and responsibility. Background: earthmoving, paving, sewers & bridge design. PW-5159, Engineering News-Record.

Construction Supt. General Construction. PW-4482, Engineering News-Record.

Registered Engineer, 34, married, M.S. in C.E., structural, with 12 years experience in design of buildings, industrial structures and bridges, desires position with responsibility and future. Resume upon request. PW-5258, Engineering News-Record.

Asst. Supt. or General Foreman, Age 40—15 years experience in all phases of highway work, know methods, men & equipment. PW-5123, Engineering News-Record.

Structural Engineer, PE, 12 years well rounded experience in design, construction, and administration of concrete and steel commercial, industrial, apartment, and institutional buildings, seeks engineering administrative position firm in East. Currently employed, will relocate. PW-5229, Engineering News-Record.

Former consultant, 56, highly productive, ample capital, seeks association with established engineering organization N. Y. City area. PW-5232, Engineering News-Record.

Sewer foreman with broad experience on deep cut projects would like to tackle a sewer job that requires more than ordinary skill. PW-5272, Engineering News-Record.

(Continued on the following page)

ARCHITECTS

Permanent positions in our St. Louis office for graduate Architects or equivalent experience. Prefer men who have had experience as job captain for the design of industrial and institutional type buildings. Architectural services include preparation of both preliminary and final architectural designs, plans perspective and renderings.

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Permanent position in our Architectural Section for an experienced person for the preparation of specifications and cost estimates.

Positions offer long range employment with opportunity for professional development. Many company benefits including paid vacation, sick leave, holidays. Excellent retirement plan.

Submit complete resume include salary data.

SVERDRUP & PARCEL ENGINEERING COMPANY

Engineers—Architects

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• POSITIONS WANTED

(Continued from preceding page)

General Manager; 41 yrs. old. Fully experienced in all phases of Heavy, Highway, and Airport Construction business. Prefer west of Mississippi River. References. Available for interview. R. E. Phillips, 512 Conkey, Burlington, Wis. Ph. Rockwell 3-7549.

Project Management, Contract Admin. 22 yrs. hvy. constr. including estimating, procedures, supervision, claims. Major projects U. S. & O. S. PW-5263, Engineering News-Record.

Cost Engineer—Degrees in engineering and accounting; 12 years experience chemical and petrochemical plant estimating, cost control, cost analysis, and engineering economic evaluation; available immediately; excellent references. PW-5259, Engineering News-Record.

Water Work-Irrigation: Project Eng. BSME married 33. Past 6 years experience in equipment design and installation, 3 years construction exp. Foreign only. PW-5268, Engineering News-Record.

Structural engineer, multi-state registration, mid-thirties. Experienced design, construction, building products. Project responsibility. Relocate. PW-5269, Engineering News-Record.

Equipment Supt. or master mechanic—age 54, a qualified supervisor of repair and preventive maintenance of all types of construction equipment. 30 years experience. PW-5264, Engineering News-Record.

Manager of Construction—twenty-five years corporate engineer in charge of profitability analysis, cost estimating, scheduling, construction supervision and cost control for major process industry projects. On-time completions, minimum costs, smooth start-ups. PW-5267, Engineering News-Record.

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College graduation with a degree in engineering. Must be a registered Michigan Professional Engineer in Civil or Mechanical Engineering. Preference will be given to middle age with experience in educational institutions or public works. Must be personable and demonstrate ability to understand and work with people. Experience in supervision of men desired.

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Starting salary: Junior $527. Assistant $621. Special studies in municipal water sanitation. Requires BS degree in engineering from a college accredited by the Engineers' Council for Professional Development or possession of a California Engineer-in-Training certificate. Assistant requires two years experience. Advanced degree may substitute for one of these years. Apply before September 26, 1960.

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Salary commensurate with background and **experience. Please contact**

Personnel Director,

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Consulting Engineers
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Reply giving brief resume of experience, education and salary expected.

P-5188, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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Send detailed resume of education, experience and salary requirements.

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World Wide Contacts
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Sales experience Essential

Minimum investment $50,000.00

Annual income should equal investment
Send complete resume first letter

P-4350—Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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45 TON GEN. ELEC. DIESEL ELEC. LOCOS.
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W-5248, Engineering News-Record
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Nor Wind, Nor Waves

HURRICANE DONNA had blasted Puerto Rico and was churning her way toward the East Coast last week as a group gathered in New York City to receive the money for the bridge and tunnel crossing of treacherous Chesapeake Bay. They held a check for $178 million in their hands, but in their ears must have echoed the roar of Donna's wind as they contemplated their start on the challenging job to be done. As they hefted that check, the builders knew full well that their share of it will not be earned without a struggle.

The 17½ miles across the mouth of Chesapeake Bay is in reality open ocean. For who's to say where the bay ends and the Atlantic begins? This 195-mile-long bay is called the largest body of "protected" tidewater on the Atlantic Coast, but where's the protection at its mouth?

YACHTING magazine has described Chesapeake Bay this way: It has a special brand of squalls, most frequent in July and August. They come with warning, but with winds to 50 and 60 mph. Autumn gales or winter storms can be hazardous for all but the staunchest ocean-going yachts; even hardy work boats have trouble in the short, steep seas. The bay's normal tide range is a low 2½ ft, but set-up from winds can far exceed that.

Such is the challenge the constructors face. There is precedent for the crossing's length in Lake Ponchartrain's 23-mile bridge; there is precedent for the open ocean construction in the Texas towers off all three U. S. coasts. Yet this bay crossing's combination of distance and exposure has never before been encountered.

But the builders are up to the task: Merritt-Chapman & Scott; Raymond International; Peter Kiewit; Tidewater Construction. This is an aggregation of construction talent that Donna and her successors might scare but can't beat. The whole construction industry will watch the constructors' progress. We wish them well.

Pollution Control the Hard Way

AN UNENVIABLE DISTINCTION is being earned by the fabled city of St. Joseph, Mo. Into its scrapbook of pioneer legend—Pony Express riders galloping into the wild and wooly West now may go a different kind of pioneering record: St. Joseph may become the first U. S. city to start treating its sewage under compulsion by the federal government.

It isn't certain by any means. The issue has to be battled through the courts first. But it is a fact that the U. S. Public Health Service has asked the Justice Department to enter suit against St. Joseph to force compliance with a pollution cleanup order issued under the 1956 federal water pollution control act.

A remarkable aspect of the case is that St. Joseph's defiance of the cleanup order is apparently backed by popular support. Twice the voters have defeated bond issue proposals aimed at financing needed treatment facilities—once in 1958 and again last May. The May rejection triggered the federal move toward court action.

We wonder what St. Joseph hopes to accomplish. It would take very specious or very selfish reasoning in this enlightened age to rationalize a deliberate refusal to dispose of wastes in a manner that would not be burdensome to others. And merely to gain a delay would seem a poor return for the price to be paid in notoriety.

Could it be that St. Joseph voters are clinging to some shred of pioneer independence and bedamned if they aim to stand still while bureaucrats in Washington tell them what to do? That might have a certain measure of sentimental appeal, though there are better freedoms to fight for than the freedom to pollute the rivers.

More likely, St. Joseph voters have had the misfortune to be singled out from among many, many more in this country who won't face up to their responsibilities —while others on the same river will (see p 21).

It would be a sad state of affairs if such an attitude prevailed in every attempt to clean up the streams. Without public support the whole effort might as well be dropped. And that would be a 20th century tragedy.

Why Doesn't Someone Invent...

AMONG OUR MANY WELL WISHERS are a number who tell us we should use our imagination and our journalistic enterprise to do a series of articles on things that need to be invented.

Well, just as we were searching our souls on this idea, we came across a story about how the "state authorities" of Alabama, "acting on an excellent tip from a confidential source, recently ruined a 50-ft section of an almost new highway trying to find something beneath it that would give them just cause to dig it up." It seems, according to the dispatch, that they were searching for three men in a '47 Ford car that "disappeared one rainy March night four years ago."

The story goes on to say, "for nearly three weeks state authorities carefully probed as far as 60 ft through the roadbed with a 4-in. drill before they finally abandoned the search."

This, one would say, is quite a yarn. Not quite up to Mark Twain standards, but still a good one and surely due to become part and parcel of the local lore.

If this is a fact, rather than fiction, we now make our first nomination of things that need to be invented: some apparatus that will quickly, unfailingly and nondestructively reveal what is in or under any piece of construction. Important in itself, such an invention might stimulate the invention the world is waiting for—a means for getting to an object buried under a street without tearing up the pavement.

CONCRETE PERFORMANCE REPORT:

POZZOLITH lends 5000 psi concrete high degree of workability in interesting new structure

The Munson-Williams-Proctor Institute Art Gallery, designed by Phillip Johnson and engineered by Dr. Lev Zetlin, makes use of a huge, post-tensioned criss-cross girder to produce an interior free of supporting columns. Calculations showed that this cast-in-place, 720-ton monolithic structural system, supported only at its eight extremities, provided a strength equal to sixteen 2′ x 2′ interior columns. Each of the girder's four 123′10″ sections contains 14 flexible post-tensioning cable conduits, four 4″ sleeves for balcony rods and a maze of reinforcing steel within its 10′9″ by 22″ cross section.

HUGE PRESTRESSED MONOLITHIC GIRDER—The structural system, weighing 720 tons and containing over 360 cubic yards of 5000 psi concrete was cast-in-place 50 feet above grade. The girder supports roof and hung balcony without interior columns. Facade will be covered with black Canadian granite, while girders and their supporting columns will be sheathed in bronze.

THE MUNSON-WILLIAMS-PROCTOR INSTITUTE ART GALLERY was designed by architect Phillip Johnson and engineered by Dr. Lev Zetlin, both of New York City. Supervising architects were Bice and Baird of Utica. The George A. Fuller Company, New York City, built the art gallery, with Jack Madden as project supervisor and William Gardner as engineer. The American Hard Wall Plaster Company, Utica, supplied the POZZOLITH ready-mix concrete. Pre-cast roof sections were supplied by Schenectady Concrete Products. Post-tensioning was by Pre-Stress, Inc. of Albany.

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CONTINUOUS 16-HOUR PLACEMENT OF CONCRETE. To assure a completely monolithic member, all concrete for the girder was placed in a single, continuous operation. POZZOLITH retarded the hardening of the mix during placement, preventing horizontal cold joints.

The complexity of steel, coupled with the need for extended continuous placement of concrete to provide a truly monolithic girder, required a concrete mix which met these four specifications:

First, 5000 psi compressive strength to meet the prescribed design loads.

Second, a retarded set to assure a monolithic member completely free of horizontal cold joints and honeycomb.

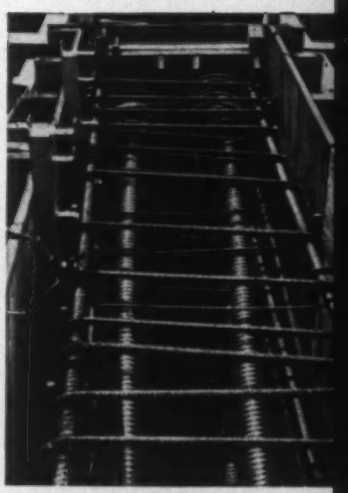
Third, a high degree of workability was required because of the complexity of steel reinforcement and conduits within each section.

Fourth, a low unit-water content for minimum shrinkage and over-all improvement of concrete quality.

The local Pittsburgh Testing Laboratory, the Alpha Portland Cement Company and the local Master Builders field men, developed a POZZOLITH concrete mix which had excellent workability and was easily placed with only 3½″ slump. It contained 20% less water than a comparable plain mix. POZZOLITH concrete gave the desired results in the monolithic girder, and in *all* the cast-in-place normal and lightweight concrete in this unique structure.

The Master Builders field men worked closely with project engineers, contractors, and concrete suppliers at the Munson-Williams-Proctor Art Gallery to achieve the common goal of uniform, superior quality concrete at lowest cost-in-place.

Write for your free copy of the *detailed* "Munson-Williams-Proctor Art Gallery Concrete Performance Report".



THE MAZE OF REINFORCING STEEL and 14 flexible conduits for the post-tensioning cables made high workability a must in the concrete mix design. Use of POZZOLITH resulted in low unit water content, yet gave a highly workable mix with 3¼″ slump.

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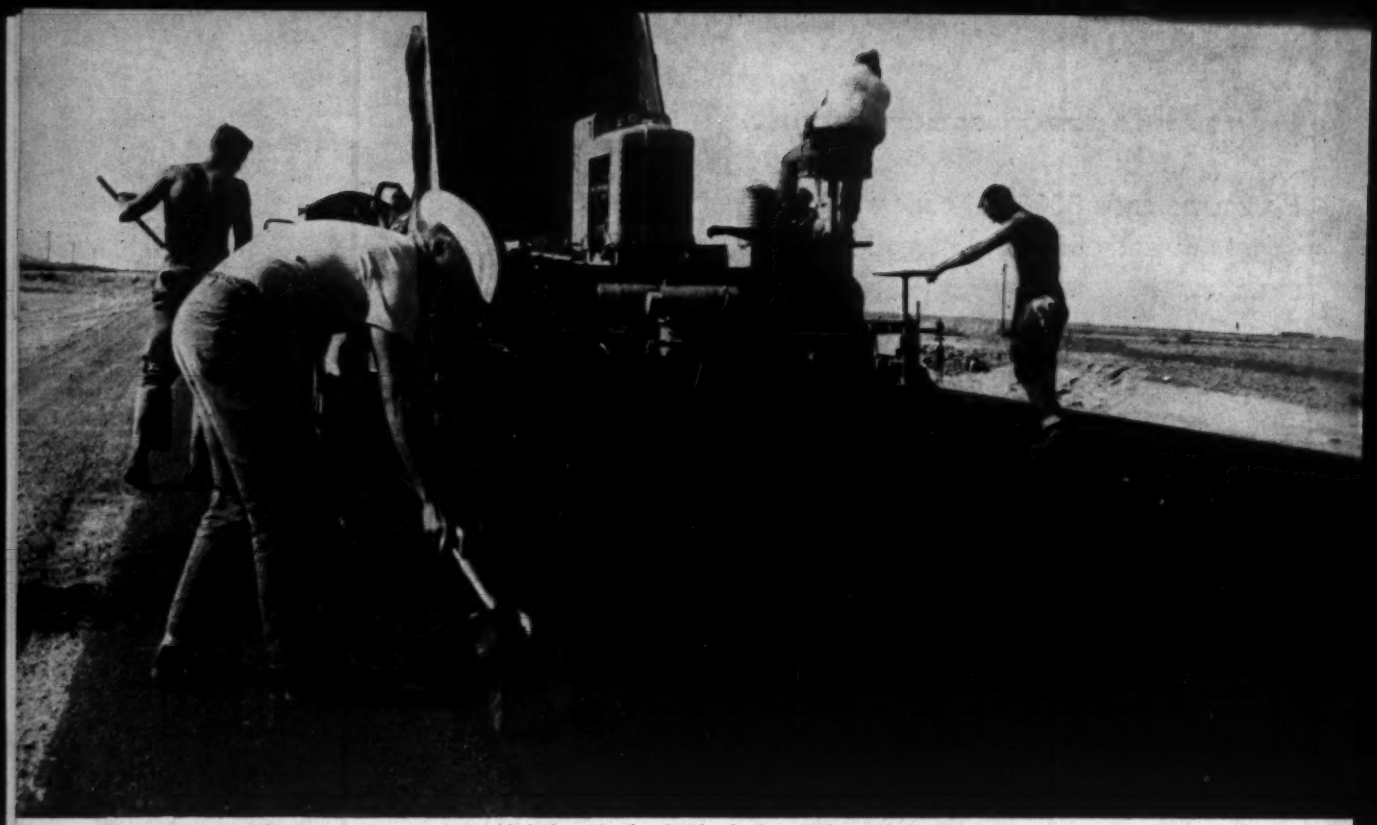

Hot-mix Texaco Asphaltic Concrete pavement is speedily laid on 11 miles of Nebraska State Highway 61. No time-consuming curing period is required.

Nebraska builds Asphalt highway for hauling wheat crop

This 11-mile section of State Highway 61 passes through Nebraska's fertile wheat growing country. At harvest time, heavy trucks loaded with grain use the highway to reach elevators and rail heads.

The pavement constructed on this heavily traveled route consists of three inches of heavy-duty hot-mix Texaco Asphaltic Concrete, laid on a six inch granular base. The Texaco Asphaltic Concrete was placed in two courses, a 1½ inch binder course and 1½ inch wearing surface. Nebraska used an asphalt cement with a 100-120 penetration in the pavement mix.

This Texaco-paved State Highway combines rugged durability with a moderate first cost and low upkeep cost. It is speedily laid, since it requires no time-consuming curing period. Because of its resilience and freedom from expansion joints, it has a velvet-smooth riding surface which is appreciated by truck drivers and motorists alike.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils provide the road builder with a wide choice of heavy-duty, intermediate and low-cost types of paving for highways, streets and airports. Whatever your paving project, one of these types is exactly suited to your requirements. For helpful information on all of these Asphalt types, mail the coupon below for the two Texaco brochures. There is no obligation.

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Please send me your two brochures containing helpful information on heavy-duty, intermediate and low-cost types of Asphalt construction for highways, streets, airports, etc.

Texaco Inc., Asphalt Sales, 135 E. 42nd Street, New York 17, N. Y.

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